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MODELING THE DMSP AND CRRES DOSIMETERS USING THE PATH LENGTH DISTRIBUTION METHOD

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The Path Length Distribution method is used to model the performance of the dosimeter instruments used aboard the DMSP and the CRRES satellites. The Monte Carlo methods used to compute the path length distributions for the isotropic, mirror plane, and $\sin^N \alpha$ pitch angle proton angular distributions (N = 4, 6, 8, and N = 999 [for comparison with the Mirror Plane Distribution]) are described. The path length distributions are used to compute the instrument proton flux and dose count response functions and geometric factors for power law and Maxwellian proton energy spectra. Comparisons of the geometric factor computations using the path length method with the infinite slab approximation and the truncated infinite slab path length distribution are also made. Tables and Graphs of modeled instrument performance are provided.

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1. INTRODUCTION

This report describes the use of the path length distribution method to model the performance of the dosimeter instruments used on board the DMSP and CRRES satellites. These instruments are used to measure the radiation dose encountered by the satellites. Each instrument consists of four aluminum hemispheric domes, at the center of which is a solid state silicon particle detector. Since the dimension of the detector is small compared to the hemisphere radius, a proton reaching the detector is assumed to pass on a straight line path through a known thickness of the hemisphere shell, and, continuing in a straight line, reaches the detector. It then deposits all (if it is stopped) or part of its remaining kinetic energy (if it passes through) in the detector. The energy loss is recorded both as a count (an energy pulse is recorded) and a dose (the amount of energy deposited is recorded).

In order to use the path length distribution approach, it is necessary to model the detector as a disk of silicon in which the protons can either enter the top or the side of the disk (moving horizontally or downwards). Only the active regions of the detector are modeled; it is not possible to model the "dead" space using the path length distribution. Modeling the latter would require a full Monte Carlo calculation, with a requirement for an order of magnitude or larger usage of computer resources.

The amount of energy deposited by a proton in the silicon detector depends upon both the energy incident on the detector, and the path length [the distance along a straight line path] travelled by the proton. The thickness of the aluminum hemispherical shell is selected to eliminate electrons and protons with energies lower than specified thresholds.

Previous modeling of the DMSP and CRRES dosimeters used an alternative method, which relies upon the infinite slab approximation. A brief description of this method together with a description of the DMSP dosimeter is provided in Section 2. A brief description of the CRRES dosimeter and of the differences between the DMSP and CRRES dosimeters is provided in Section 3.

Because the path length distribution method is not well documented in the literature, a detailed theoretical description of the path length method will be provided in Section 4, with examples of path length distributions for special simple cases. Generally it is necessary to use Monte Carlo methods to compute the path length distribution; in some cases, however, it is possible to use analytic methods, in particular, for the infinite slab case, resulting in the infinite slab path length distribution. A truncated version of the infinite slab approximation, in which path lengths longer than the maximum dimensions of the detector are excluded, is also discussed.

The Monte Carlo computations for the isotropic and mirror plane distributions are described in Section 5. Two path length distributions are computed, one, for entry through the top of the detector and one from the side. Using geometric arguments, they are combined into the path length distribution.

The response functions calculations for the dosimeter flux and dose channels are described in Section 6. The computation of the geometric factors for power law and other spectra using the response functions is described in Section 7 together with tables for the isotropic, mirror plane, and $\sin^N \alpha$ distributions. In Section 8 this report concludes with a comparison of Geometric Factor computations obtained from path length distributions and the other methods described in this report.

2. THE *DMSP* DOSIMETER

The objective of modeling the DMSP Dosimeter is to interpret the observational data obtained from the instrument in terms of the physical environment encountered by the satellite. In particular, the objective is to use the observed proton count and dose data to compute the proton flux, as a function of energy and angular distribution, the latter, particularly with reference to the magnetic field direction.

Following an approach by *Sullivan* [1971], it is assumed that a differential proton flux (Sullivan's "Spectral intensity") $j(E,\mathbf{x},\Omega,t)$; units: protons/(sec cm^2 steradian MeV) is incident on each of the hemispheric domes. For each detector there are four proton channels, two each for flux and dose [LOLET (also referred to as "electron" channels, because they are also sensitive to high energy electrons) and HILET]. The LOLET and HILET flux channels record the number of charged particles which deposit energies in the individual silicon detectors in the range [0.05, 1] and [1, 10] MeV during a measurement interval respectively. The LOLET and HILET dose channels record the accumulated energy deposited by the LOLET and HILET protons during the same interval.

The counting rate for the k'th channel for an instrument is given by:

$$\frac{dN_k}{dt} = \int_S \boldsymbol{u} \cdot d\boldsymbol{A} \int_\Omega d\Omega \int_0^\infty dE\ \eta_k(E,\Omega,\ldots)\ j(E,\boldsymbol{x},\Omega,t) \tag{2.1}$$

where η_k is the detection efficiency, $d\boldsymbol{A}$ is a directed area element (in the direction of the normal to the detector surface at location $\boldsymbol{x}$), $\boldsymbol{u}$ is a unit vector (pointing towards the direction of an incoming particle), $d\Omega$ an element of solid angle, j is the differential flux. The integration takes place over the surface of the detector S, over the solid angle Ω and over the energy E.

For a planar detector, the above integral can be greatly simplified, providing that the differential flux does not significantly vary over the dimensions of the detector, does not significantly change over the individual data collection interval, and can be expressed as a product $j(E,\Omega) = j(E)\ h(\Omega)$. Choosing spherical coordinates for which the top detector surface lies in the equatorial plane, we obtain:

$$\int_S d\boldsymbol{A} \cdot \boldsymbol{u} = A\ \cos\theta$$

$$\frac{dN_k}{dt} = A \int_E j(E)\ G_k(E)\ dE \tag{2.2}$$

where

$$G_k(E) = \int_\Omega \eta_k(\theta,\phi,E)\ \cos\theta\ h(\theta,\phi)\ \sin\theta\ d\theta\ d\phi$$

where A is the detector surface area; the quantity $G_k(E)$ is called the energy dependent geometric factor or the response function. The geometric factor (for a given spectrum $j(E)$) is defined as dN/dt divided by the omnidirectional flux.

Even with these simplifications, for the simplest case, that of an isotropic angular distribution, these computations are difficult, and approximations are unavoidable.

The dimensions of the detectors, and the thicknesses of each of the aluminum hemispheres used in the DMSP dosimeter are given in Table 1. The thickness of the hemisphere shell is expressed in units of gm/cm^2, which is actually the product of the actual thickness (in cm) by the density of aluminum; these units are convenient for the computation of energy loss for protons which penetrate the dome and reach the detector.

In a report on the DMSP Dosimeter [*Gussenhoven, et al.* 1986], response function computations were reported for the isotropic case, and for the mirror plane case (for angles of 0 to 80 degrees magnetic inclination at 10 degree intervals). In addition, tables of geometric factors were presented for energy spectra of the form $(20/E)^N$. The published tables for the isotropic case are reproduced in Table 2 below. Note that a relative normalization was used for these tables.

The approximation used in the DMSP report for the isotropic case makes use of geometry of the DMSP detectors and the infinite slab approximation. First, the response function (normalized by unit area) for a bare detector was computed using the infinite slab approximation as follows: For the isotropic case, $h(\theta,\phi) = 1$, η_k does not depend on ϕ; and, depending upon the computed energy loss in silicon, takes on the value 0 or 1 for a flux channel, or is assigned discrete values in the range 0 - 15 for the dose channels, depending on the energy loss in the detector. The integration limits on the angle θ define the θ intervals for which η_k takes on a particular (discrete) non-zero value. The path length equation $q = d/\cos\theta$ (d is the thickness of a detector, taken to be 400 microns for each of the four detectors) corresponding to the channel boundaries (for flux) and the different dose levels for the dose channels is used to compute the integration limits for θ. Then, for each value of the external energy, the energy loss after penetrating through each of the domes is computed, using an analytic range-energy relation for aluminum. The bare detector response for that energy is the detector response function for the value of the external energy.

The geometric factor for a given spectrum is then obtained by integrating the product of the energy spectrum by the response function over the external energy.

TABLE 1. Physical and Geometric Parameters of the DMSP Detectors

Detector #	Detector Area [cm^2]	Detector Thickness [microns]	Ratio: thickness/radius D/R	Thickness of Aluminum Hemisphere [gm/cm^2]	Minimum Proton Energy Required to Penetrate Aluminum Hemisphere [MeV]
1	0.051	398	0.312373	0.55	20
2	1.000	403	0.071430	1.55	35
3	1.000	390	0.069126	3.05	51
4	1.000	384	0.068092	5.91	75

TABLE 2. DMSP Geometric Factors (Relative Normalization) for Power Law Spectrum: $j(E) = (20/E)^N$

Omnidirectional Geometric Factors for DMSP Flux Channels for Protons [cm^2 MeV]

	HILET CHANNELS				LOLET CHANNELS			
N	1	2	3	4	1	2	3	4
0.1	3.096	55.95	48.49	42 36	29.27	569.0	566.0	557.1
0.2	2.671	47.20	40.23	34.44	21.37	414.8	412.1	404.5
0.3	2.325	40.10	33.56	28.12	15.67	303.6	301.2	294.6
0.4	2.040	34.29	28.15	23.06	11.54	223.1	221.0	215.4
0.5	1.804	29.49	23.72	18.98	8.543	164.8	162.8	158.0
0.6	1.607	25.50	20.08	15.68	6.354	122.2	120.5	116.4
0.7	1.441	22.17	17.07	13.00	4.751	91.08	89.56	86.06
0.8	1.300	19.36	14.57	10.80	3.572	68.22	66.88	63.88
0.9	1.179	16.97	12.47	9.005	2.701	51.37	50.19	47.62
1.0	1.075	14.94	10.71	7.525	2.054	38.89	37.84	35.64
1.1	.9851	13.20	9.225	6.303	1.572	29.59	28.68	26.79
1.2	.9064	11.70	7.966	5.291	1.210	22.65	21.84	20.23
1.3	.8373	10.41	6.896	4.450	.9368	17.43	16.72	15.33
1.4	.7764	9.267	5.983	3.749	.7300	13.49	12.87	11.68
1.5	.7224	8.280	5.201	3.164	.5723	10.50	9.949	8.929
1.6	.6742	7.415	4.529	2.674	.4514	8.213	7.733	6.857
1.7	.6312	6.655	3.951	2.263	.3582	6.461	6.040	5.288
1.8	.5925	5.984	3.452	1.918	.2859	5.110	4.740	4.095
1.9	.5577	5.391	3.021	1.628	.2295	4.063	3.738	3.184
2.0	.5262	4.865	2.647	1.383	.1853	3.246	2.961	2.485
2.2	.4715	3.980	2.039	1.001	.1226	2.102	1.883	1.531
2.4	.4251	3.274	1.578	.7267	.0827	1.386	1.217	.9565
2.6	.3874	2.707	1.226	.5294	.0568	.9281	.7978	.6054
2.8	.3547	2.248	.9557	.3877	.0396	.6306	.5302	.3877
3.0	.3265	1.874	.7472	.2832	.02798	.4340	.3565	.2509
3.5	.2714	1.207	.4084	.1311	.01234	.1786	.1381	.0879
4.0	.2313	.7921	.2262	.0614	.00575	.0774	.0562	.0322
4.5	.2010	.5270	.1266	.0289	.00279	.0349	.0237	.0122
5.0	.1776	.3550	.0716	.0138	.00140	.0162	.0103	.0047
6.0	.1436	.1659	.0233	.0032	.00037	.0037	.0021	.0008
7.0	.1201	.0800	.0078	.0007	.00011	.0008	.0004	.0001
8.0	.1029	.0394	.0027	.0002	.00003	.0002	.0001	.00001
9.0	.0879	.0198	.0008	.00001	.00001	.0001	.00001	.00001
10.0	.0792	.0101	.0003	.00001	.00001	.00001	.00001	.00001

Omnidirectional Proton Geometric Factors for DMSP Dose Channels [cm^2 MeV]

	HILET CHANNELS				LOLET CHANNELS			
N	1	2	3	4	1	2	3	4
Multiply by:	10^{-3}	10^{-3}	10^{-3}	10^{-3}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
0.1	129.8	144.3	495.1	427.2	1531.	1495.	576.1	554.2
0.2	113.6	123.1	414.5	349.7	1158.	1127.	433.5	415.0
0.3	100.2	105.8	349.0	287.6	880.9	854.3	327.8	312.0
0.4	89.15	91.46	295.4	237.4	673.9	650.9	249.1	235.8
0.5	79.88	79.52	251.2	196.8	518.6	498.6	190.2	178.7
0.6	72.06	69.51	214.5	163.6	401.5	384.0	146.0	136.1
0.7	65.39	61.05	183.9	136.5	312.6	297.4	112.6	104.1
0.8	59.67	53.85	158.3	114.2	244.9	231.5	87.31	79.98
0.9	54.72	47.68	136.6	95.76	193.0	181.2	68.01	61.70
1.0	50.40	42.37	118.3	80.51	152.9	142.6	53.24	47.79
1.1	46.61	37.78	102.7	67.84	121.9	112.8	41.87	37.17
1.2	42.26	33.77	89.34	57.27	97.68	89.67	33.08	29.02
1.3	40.29	30.28	77.91	48.44	78.70	71.63	26.25	22.74
1.4	37.63	27.20	68.08	41.03	63.74	57.49	20.92	17.89
1.5	35.25	24.50	59.60	34.82	51.89	46.36	16.75	14.12
1.6	33.09	22.10	52.26	29.58	42.44	37.54	13.46	11.18
1.7	31.15	19.98	45.90	25.16	34.87	30.53	10.85	8.960
1.8	29.38	18.09	40.36	21.43	28.77	24.92	8.784	7.083
1.9	27.76	16.41	35.54	18.28	23.84	20.42	7.134	5.662
2.0	26.28	14.90	31.33	15.60	19.83	16.80	5.813	4.539
2.2	23.67	12.23	24.43	11.39	13.86	11.47	3.895	2.940
2.4	21.44	10.26	19.12	8.348	9.820	7.930	2.638	1.922
2.6	19.52	8.563	15.01	6.134	7.037	5.541	1.804	1.268
2.8	17.85	7.174	11.82	4.518	5.094	3.908	1.245	0.842
3.0	16.40	6.028	9.332	3.334	3.721	2.779	0.865	0.564
3.5	13.45	3.947	5.216	1.573	1.753	1.222	0.359	0.212
4.0	11.22	2.620	2.947	0.749	0.858	0.557	0.154	0.092
4.5	9.495	1.757	1.680	0.359	0.432	0.261	0.067	0.032
5.0	8.125	1.189	0.964	0.173	0.223	0.125	0.030	0.013
6.0	6.110	.5557	0.323	0.041	0.062	0.030	0.006	0.002
7.0	4.721	.2653	0.110	0.010	0.018	0.008	0.001	.0001
8.0	3.722	.1288	0.038	0.002	0.006	0.002	.0001	.0001
9.0	2.981	.0633	0.013	.0001	0.002	0.001	.0001	.0001
10.0	2.417	.0314	0.005	.0001	0.001	.0001	.0001	.0001

3. THE *CRRES* DOSIMETER

The CRRES dosimeter design is based upon the DMSP, but with differences which are dictated by the harsher radiation environment resulting from the CRRES orbit. The DMSP series of satellites use nearly circular "sun synchronous" orbits with an altitude of approximately 800 km. Sun synchronous orbits have a high inclination (nearly polar), and the inclination is chosen so that the orbital plane precesses in one year, with the result that they maintain the same local time on each half orbit. The CRRES satellite orbit is highly eccentric (e ~ 0.7), 350 - 37000 km altitude, and an inclination of about 18 degrees. The resulting orbit takes it through the radiation belts; the dimensions of the detectors, and the scaling of flux and dose counters have been changed to take into account the much harsher radiation environment.

Subject to possible limitations of the validity of the infinite slab computation, the analysis performed for computing the DMSP response functions and geometric factors remain valid for the CRRES dosimeters, with the principal changes due to the smaller detectors areas for detectors 1, 2 and 3.

The physical parameters for the CRRES Dosimeter are provided in Table 3.

TABLE 3. Physical and Geometric Parameters of the CRRES Detectors

Detector #	Detector Area [cm^2]	Detector Thickness [microns]	Ratio: thickness/radius D/R	Thickness of Aluminum Hemisphere [gm/cm^2]	Minimum Proton Energy Required to Penetrate Aluminum Hemisphere [MeV]
1	0.00815	403	0.79123	0.55	20
2	0.051	434	0.34063	1.55	35
3	0.051	399	0.31326	3.05	51
4	1.000	406	0.07196	5.91	75

4. THE PATH LENGTH DISTRIBUTION

In the path length distribution approach, the flux integral is computed by means of a transformation of variables, in which the solid angle integration variables are replaced by the path length variable. This change of variables is convenient, for the most part, since what is measured is the the energy losses in solid state detectors, and the energy losses may be computed using the empirically determined published energy-range relation laws.

The path length distribution may be considered to be either a histogram of possible path lengths or (if normalized to 1) as the probability that a particle passing through the material object in a straight line will have a given path length. The path length distribution depends only on the geometry of the detector and on the particle angular distribution. For protons, the assumption of straight line motion through the detector is an excellent approximation.

The path length distribution approach is also convenient for the use of Monte Carlo methods. Instead of computing the path length and energy loss for each Monte Carlo trial, it is only necessary only to compute the path length distribution once, and use the latter for computation of the energy loss when needed.

In using a Monte Carlo approach to computing either the usual flux integral, or in computing the path length distribution, it is important to derive the correct distribution for the physical parameters of interest. Although the procedure outlined by *Sullivan* [1971] for computing the flux integral (Eq. (2.1)) appears to be straight forward, it can easily be incorrectly understood and implemented. For this reason, a more general procedure, will be presented here, one which describes how to derive the correct distributions.

(1) Pick a point x randomly on the detector surface. There are a myriad possibility of ways in which to do this, but only one method makes sense physically - for a flat surface, equal probability must be assigned for equal areas.

(2) Compute the unit normal vector $\boldsymbol{n}$ to the surface of the detector at x as a function of the angles, usually in a spherical coordinate system.

(3) Pick an arbitrary unit vector $\boldsymbol{u}$ in the direction of the velocity vector (that is, express $\boldsymbol{u}$ in terms of the angles and other (angular distribution) parameters.

(4) Compute the dot product of $\boldsymbol{u}$ and $\boldsymbol{n}$ (again, as a function of angles and other parameters)

(5) Compute $d\Omega$, the element of solid angle.

(6) Express the particle angular distribution F as a function of the solid angle parameters (and other, relevant physical parameters).

If the following product

$$F(\Omega)\ \boldsymbol{u} \bullet \boldsymbol{n}\ d\Omega$$

is separable in the angle variables, -- that is, it may be expressed as $(F_1(\alpha_1)\ d\alpha_1)\ (F_2(\alpha_2)\ d\alpha_2)$, then the correct probability distributions for α_1 and α_2 are given by G_1 and G_2 where $dG_1 = F_1(\alpha_1)\ d\alpha_1$ and $dG_2 = F_2(\alpha_2)\ d\alpha_2$.

If the above product is not separable, then it is still possible to evaluate the integrals using Monte Carlo methods. The method used in such cases is described in Sections 5.2.2 and 5.3.

For the isotropic case, $G_1 = \cos^2(\alpha_1)$ where α_1 is the polar angle, and $G_2 = \alpha_2$ where α_2 is the azimuth in spherical coordinates.

For Monte Carlo computations, a single trial proceeds as follows: A point on the detector is chosen at random (see (1) above), and the random numbers g_1 and g_2 are selected, and are used to compute the velocity direction **u**. For the isotropic case, $g_1 = \cos^2(\alpha_1)$ is used to define α_1 and $\alpha_2 = 2\pi\ g_2$. The corresponding path length q is computed, and the corresponding bin for q is incremented by 1.

For a number of simple geometries, the path length distribution may be obtained from the angular distributions by means of a simple transformation of variables. This will be done below for the isotropic distribution and the mirror plane distribution for the simple example of an infinite slab, and for special orientations for a circular disk geometry for the mirror plane distribution.

4.1 INFINITE SLAB ISOTROPIC PATH LENGTH DISTRIBUTION

For this case the path length distribution computation may be obtained by means of a simple transformation of variables.

Consider a plane surface of unit area. The number of particles from an isotropic distribution striking the plane surface will be proportional to $\cos\beta\ d\Omega$ where β is the angle between the normal to the surface and the direction of incidence and $d\Omega = \sin\beta\ d\beta\ d\phi$ is an element of solid angle, where ϕ is the azimuthal angle. The probability of a particle striking the unit surface will be proportional to $d(\cos^2\beta)$. The path length through the infinite slab will then be $q = D\ /\ \cos\beta$. Solving for $\cos\beta$ we obtain $\mu = \cos\beta = D/q$. The normalized path length distribution is obtained by transforming the probability integral $\int\ d\mu^2$ from μ^2 to the variable of interest q, and is given by $F(q) = |\ d\mu^2/dq\ | = 2D^2/q^3$ where $q \geq D$, and takes on a value of 0 for $q < D$ since D is the minimum possible path length.

For a parallel Monte Carlo computation, pick random numbers μ^2 from a uniform distribution between 0 and 1, and then compute $q = D\ /\ \mu$. Form a histogram of the values of q obtained in this manner, and normalize.

The Infinite Slab Isotropic Path Length Distribution and Infinite Slab approximation computation are mathematically equivalent, in the sense that they should, except for possible numerical problems, give exactly the same result. One practical difficulty arises, that there is no maximum path length, and it is necessary to truncate the path length distribution in order actually perform the calculation. There is a "natural" cutoff for the path length: The maximum possible path length within the detector, which is given by $q_{max} = \sqrt{(4\ R^2\ +\ D^2)}$. The truncated path length distribution take the form (before normalization) of $1/q^3$ for $D \leq q \leq q_{max}$, and 0 for $q > q_{max}$. This truncated path length distribution will be used to describe the effect of longer path lengths on the geometric factor computations later in this report.

4.2 INFINITE SLAB MIRROR PLANE DISTRIBUTION

The detector geometry for the mirror plane case is illustrated in Figure 1 for a disk shaped detector. The mirror plane geometry is defined by λ, the angle between the magnetic field vector $\boldsymbol{B}$ and the normal to the detector surface $\boldsymbol{n}$. Each plane perpendicular to $\boldsymbol{B}$ is a mirror plane. For each point either on the detector top surface, or within the volume of the detector, there is a single mirror plane upon which the point lies. In the coordinate system used here, the vector $\boldsymbol{n}$ points towards the positive z axis, and the x axis lies in the plane defined by $\boldsymbol{B}$ and $\boldsymbol{n}$. The y axis is perpendicular to both $\boldsymbol{B}$ and $\boldsymbol{n}$. The angle γ is defined as the angle in the mirror plane between $-\boldsymbol{n}$ and the positive y axis. The appropriate angular distribution for γ will now be derived. In this case, the element of "solid angle" is simply $d\gamma$.

The top surface of the detector is described by the set of position vectors $x_t = (x,y,D)$. The bottom surface is described by the set of vectors $x_b = (x',y',0)$. Let $\boldsymbol{B}$ denote the magnetic field vector. Let λ denote the angle between $\boldsymbol{B}$ and the normal to the detector surface $\boldsymbol{n} = (0,0,1)$, then $\boldsymbol{B} = B\ (\sin\lambda, 0, \cos\lambda)$. An arbitrary unit vector $\boldsymbol{u}$ in a plane perpendicular to $\boldsymbol{B}$ (a mirror plane) is given by $\boldsymbol{u} = (\cos\lambda\cos\gamma, \sin\gamma, -\sin\lambda\cos\gamma)$. The path length q from x_t to x_b is obtained by solving the equation $x_b - x_t = q\boldsymbol{u}$. The result $q = D/(\sin\lambda\cos\gamma)$ follows from $x' = x + D\cot\lambda$, $y' = y + D\tan\gamma/\sin\lambda$ and $D = -(z' - z) = q\sin\lambda\cos\gamma$. The dot product $\boldsymbol{u}\cdot\boldsymbol{n} = -\sin\lambda\cos\gamma$, and we obtain $|dG/d\gamma| = \sin\lambda\cos\gamma$.

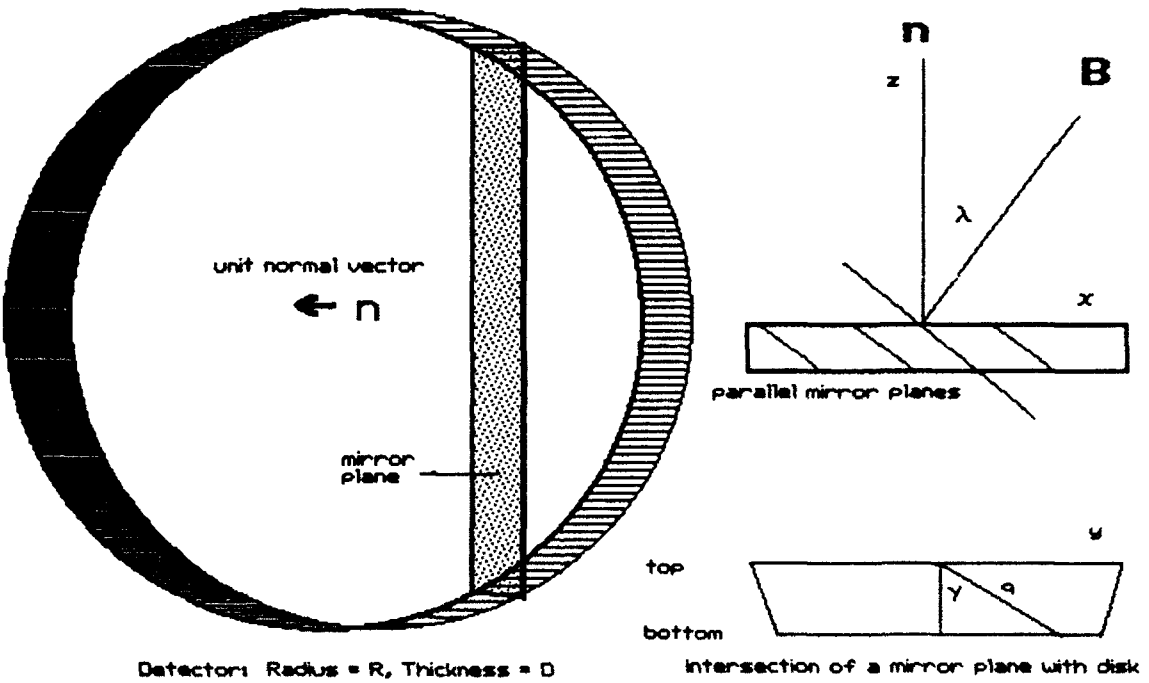

Figure 1. Detector geometry for the mirror plane case.

Since sin λ is a constant, it can be incorporated into the the overall constant factor for the flux integral; thus we choose $dG = d(\sin\gamma)$. From

$$\cos\gamma = \left(\frac{D}{q\sin\lambda}\right) \text{ we obtain } \frac{d\sin\gamma}{dq} = \frac{D^2}{q^2\sin\lambda\sqrt{q^2\sin^2\lambda - D^2}}$$

The expression on the right hand side is the desired path length distribution. Note that it is singular at $\lambda = 0$ (all path lengths are infinite!) and, for non-zero λ, at the minimum path length $q = D/\sin\lambda$.

For the parallel Monte Carlo computation, a single trial consists of picking a value of sin γ from a uniform distribution, computing q, and incrementing the counter corresponding to the bin containing the value of q. Normalize the resulting counts for the corresponding path length distribution.

4.3 MIRROR PLANE DISTRIBUTION FOR A DISK: SPECIAL CASE $\lambda = 0$

For this case, since the magnetic field is perpendicular to the top surface of the disk, every horizontal plane through the disk is a circle, and every path length is a chord. Choose an arbitrary point at the edge of the circle, and, using cartesian coordinates in the plane, choose that location as (0, 0). The length of the chord are then given by $q = 2R\cos\gamma$. The normal vector $\boldsymbol{n}$ to the circle at (0, 0) is given by $\boldsymbol{n} =$ (-1, 0). The unit velocity vector is given by (cos γ, sin γ). From $\boldsymbol{u} \bullet \boldsymbol{n} = -\cos\gamma$ it follows that $dG = -d\sin\gamma$. Solving for sin γ in terms of q, and computing $|dG/dq|$, it follows that:

$$\sin\gamma = \sqrt{1 - \frac{q^2}{4R^2}}, \quad \left|\frac{dG}{dq}\right| = \frac{q}{4R^2\sqrt{1 - \frac{q^2}{4R^2}}}$$

The above distribution is singular at $q = 2R$.

5.0 MONTE CARLO PATH LENGTH DISTRIBUTION COMPUTATIONS

In this section, we shall describe the Monte Carlo computations used to compute the path length distributions for the isotropic, mirror plane and $\sin^N \alpha$ distributions. For each of these distributions, it was necessary to break the calculation into two parts, corresponding to the case (Case 1) in which a proton enters the detector through the top surface, and leaves either through the bottom of the detector or through the side of the detector, and the case (Case 2) in which a proton enters the detector through the side and leaves either through the bottom or through the side of the detector. A geometric argument is then needed to combine the results of the two cases. Graphs are provided for the computed path length distributions.

5.1 ISOTROPIC PATH LENGTH DISTRIBUTION

5.1.1 Case 1: Top to Bottom, Top to Side Contributions

In the coordinate system used below, the center of the bottom detector is placed at the origin of the x, y plane. The z direction is the polar axis in spherical coordinates. The polar angle is β, and the azimuth angle is ψ, measured in the x, y plane from the x axis towards the y axis.

A Monte Carlo "trial" consists of the following steps: Select a random point (position vector) (x,y,D) on the top surface (with the requirement that equal areas correspond to equal probability). Then select the velocity direction (unit vector) $\boldsymbol{u} = (\cos\psi \sin\beta, \sin\psi \sin\beta, -\cos\beta)$ of the particle as follows: Select $\mu^2 = \cos^2\beta$ from a uniform distribution in the interval [0, 1], where β is the angle between the normal to the surface and the direction of incidence (see Section 4.1). Compute $\cos\beta$ and $\sin\beta$. Select the direction of the projection of the velocity vector onto the plane of the disk ψ from a uniform distribution in the interval $[0, 2\pi]$, and compute $\boldsymbol{u}$. Then use a trial value $q = D/\cos\beta$, and test whether $(x + q\cos\psi \sin\beta)^2 + (y + q \sin\psi \sin\beta)^2 \leq R^2$. If so, increment the appropriate top-bottom bin counter for q by 1. If not, solve the quadratic equation $(x + q\cos\psi \sin\beta)^2 + (y + q \sin\psi \sin\beta)^2 = R^2$ for q, and increment the appropriate top-side bin counter for q by 1.

The Case 1 contribution to the path length distribution is the sum of the top-bottom and top-side contributions, normalized, so that the sum over path lengths is equal to 1.

The results of the above calculation for CRRES detectors 1-4 are provided in graphical form in Figures 2 to 5 respectively, each using 2500 bins and 500,000 trials. Note that the top-bottom contribution is zero until it reaches $q/D = 1$, at which there is a sharp discontinuity and peak, and then gradually decreases to 0 at $q_{max} = \sqrt{(4R^2 + D^2)}$. The top to side contribution is flat until it reaches $q/D = 1$, and then gradually decreases to 0 at q_{max}.

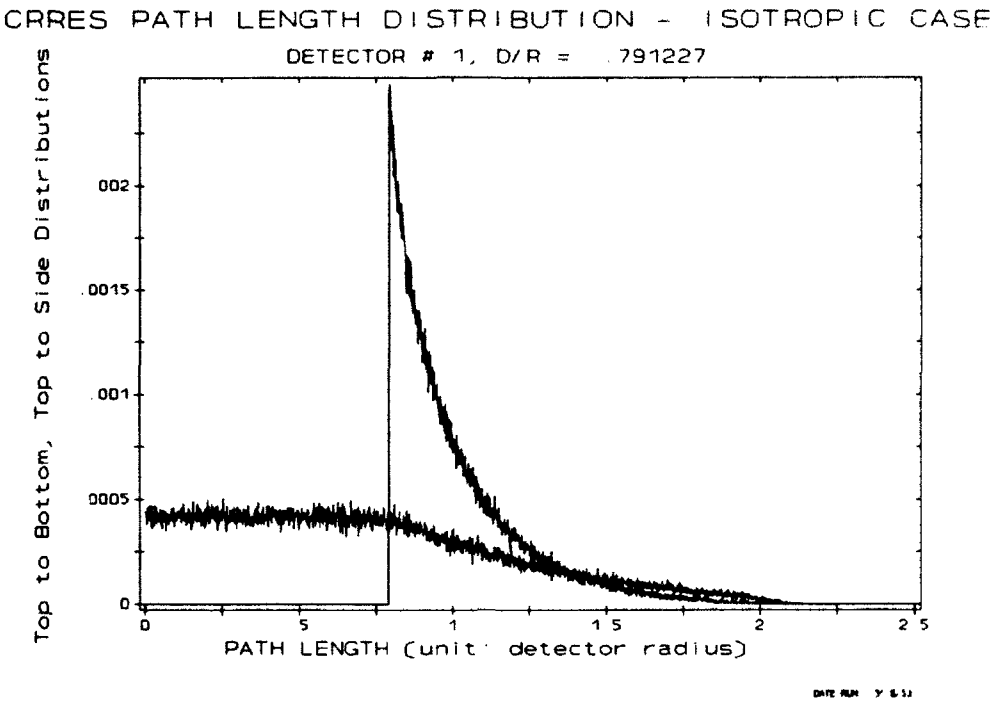

Figure 2.

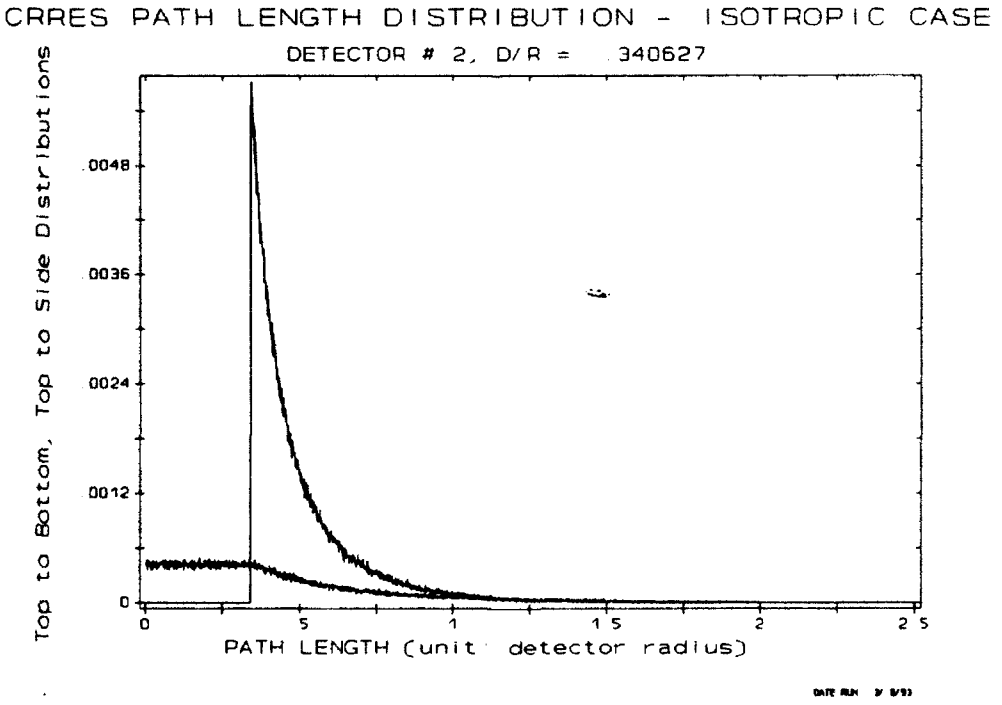

Figure 3.

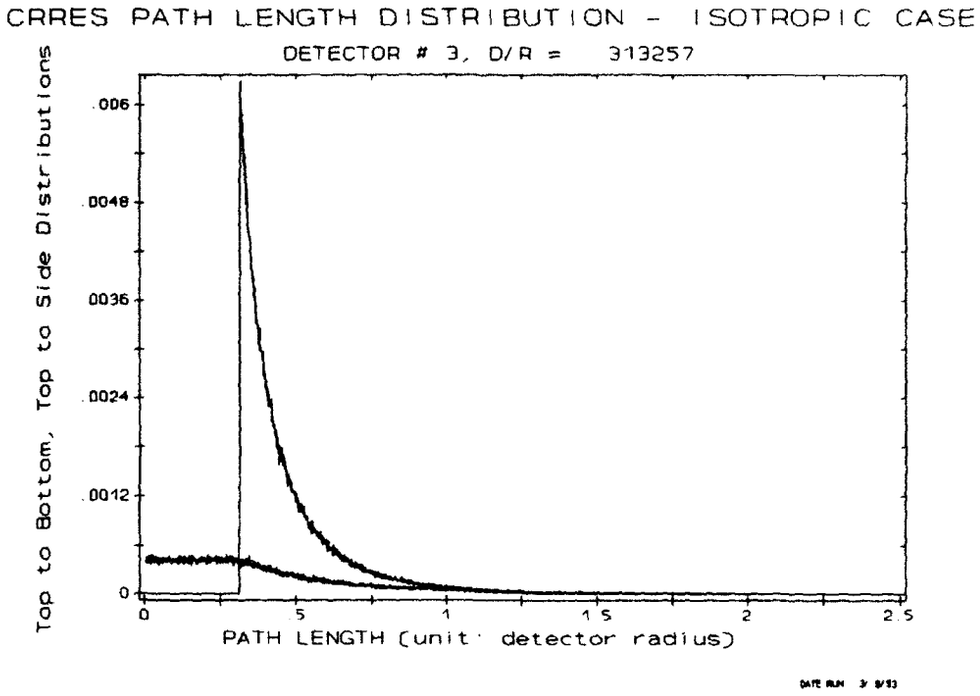

Figure 4.

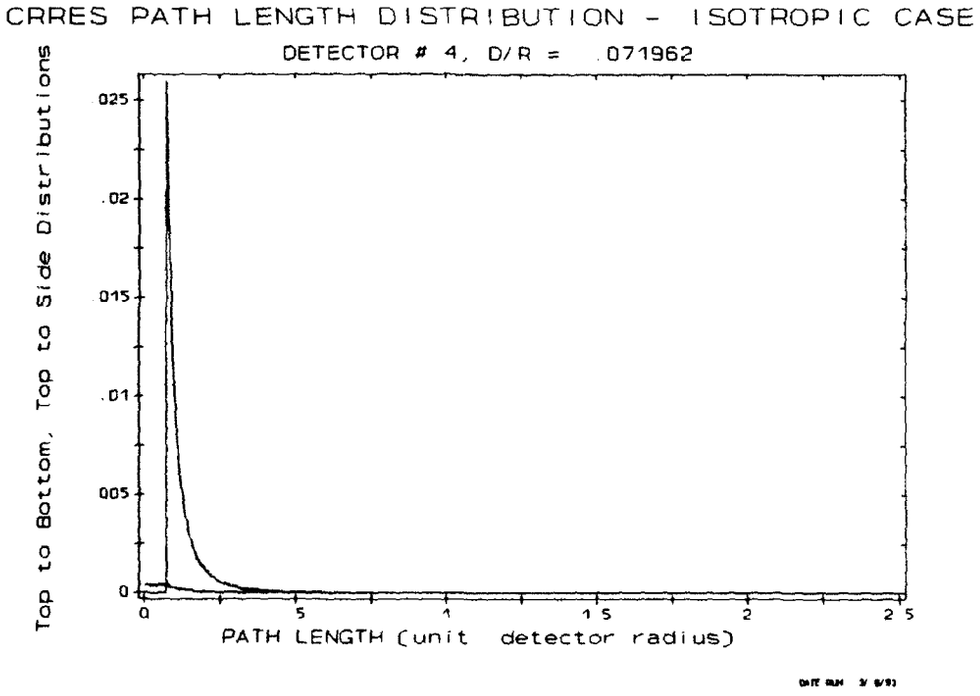

Figure 5.

5.1.2 Case 2: Side to Bottom, Side to Side Contributions

The coordinate system is the same as that used for Case 1, but the spherical coordinate system axis is the x axis, θ is the polar angle, and ϕ is the azimuth angle, measured from the y axis towards the -z axis.

A Monte Carlo "trial" consists of the following steps: For an arbitrary point on the circumference of the disk, randomly select a height h above the bottom surface from a uniform distribution in the interval [0, D]. For reasons of symmetry, the position vector of that point may be chosen to be $(-R,0,h)$. The velocity direction (unit vector) $u = (\cos\theta, \cos\phi \sin\theta, -\sin\theta \sin\phi)$ of the particle is selected as follows: Select $\cos^2\theta$ from a uniform distribution between [0, 1]. Select ϕ from a uniform distribution in the interval $[0, \pi]$ and compute u.

Note that the above computation takes only downward moving (or in the limiting case, sideways) particles; from the symmetry of the isotropic distribution, upwards moving particles would produce the same distribution. Upward moving particles are blocked by the shielding provided by instrument housing and the spacecraft. Since the distribution is normalized to one, it will be later necessary to take into account only the downwards moving particles.

For the trial value $q = h/(\sin\theta \sin\phi)$ test whether $(-R + q\cos\theta)^2 + (q\cos\phi \sin\theta)^2 \leq R^2$. If so, increment the appropriate side-bottom bin counter for q by 1. If not, select the trial value $q = 2R\cos\theta/(\cos^2\theta + \sin^2\theta\cos^2\phi)$. If $0 < q\sin\theta\sin\phi \leq h$ increment the appropriate side-side bin counter for q by 1.

The Case 2 contribution to the path length distribution is the sum of the side-bottom and side-side contributions, normalized, so that the sum over path lengths is equal to 1.

The results of the above calculation for CRESS detectors 1-4 are provided in graphical form in Figures 6 to 9 respectively, each using 2500 bins and 500,000 trials. Note that the side-bottom contribution is relatively flat up to $q/D = 1$, and then decreases (rapidly for detectors 2-4) to 0 at q_{max}. The side-side contribution increases linearly from q = 0, and develops a sharp peak at $q = 2R$, the relative size of which strongly depends upon D/R.

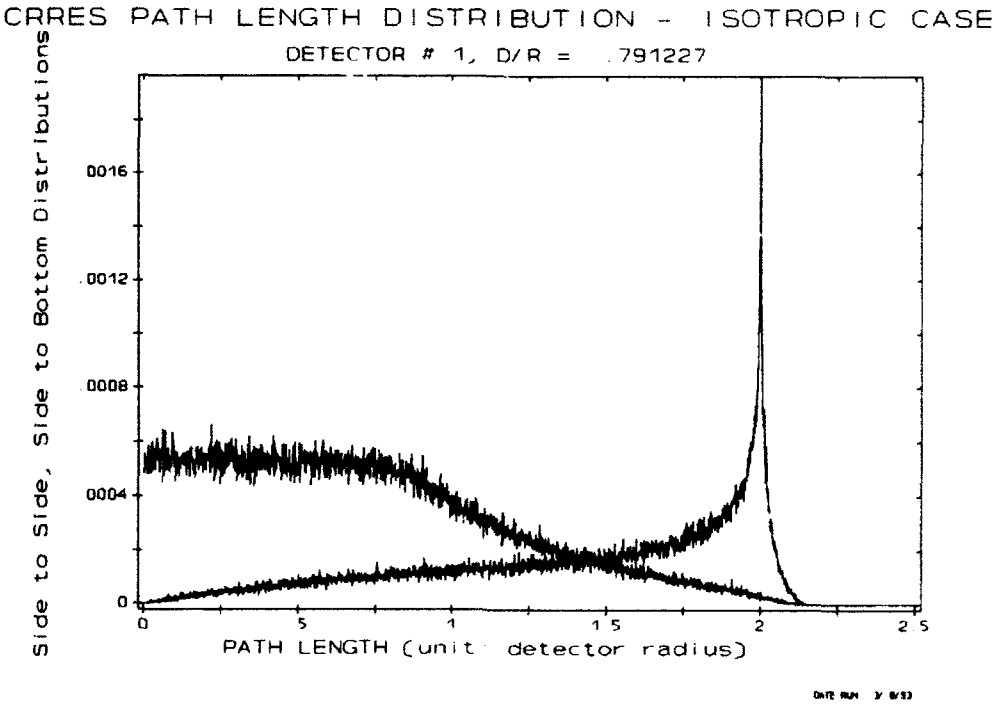

Figure 6.

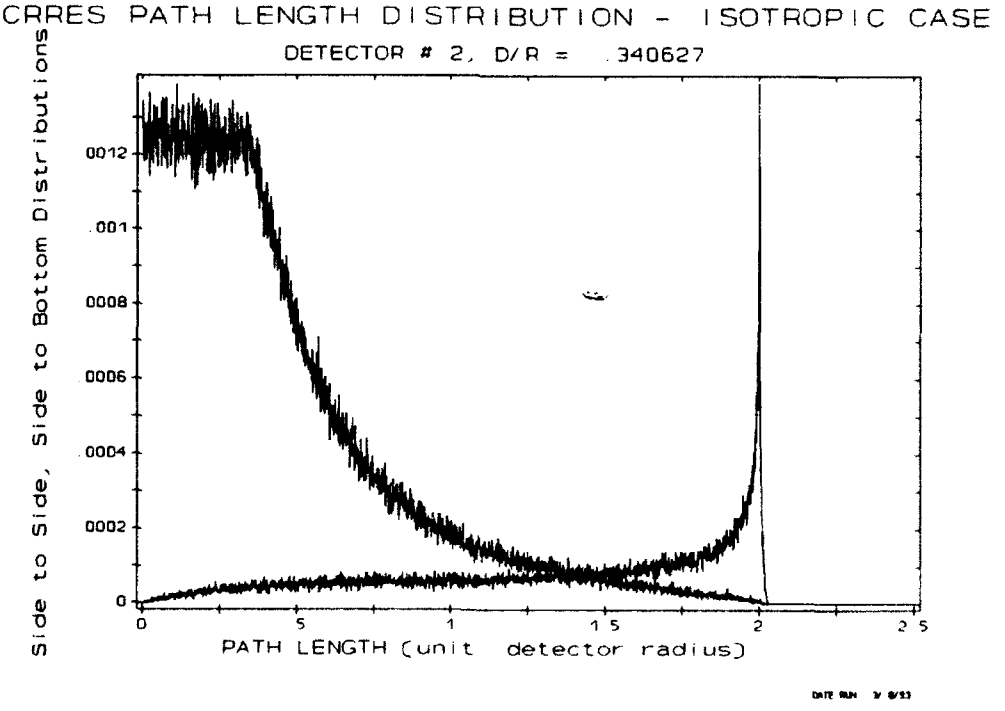

Figure 7.

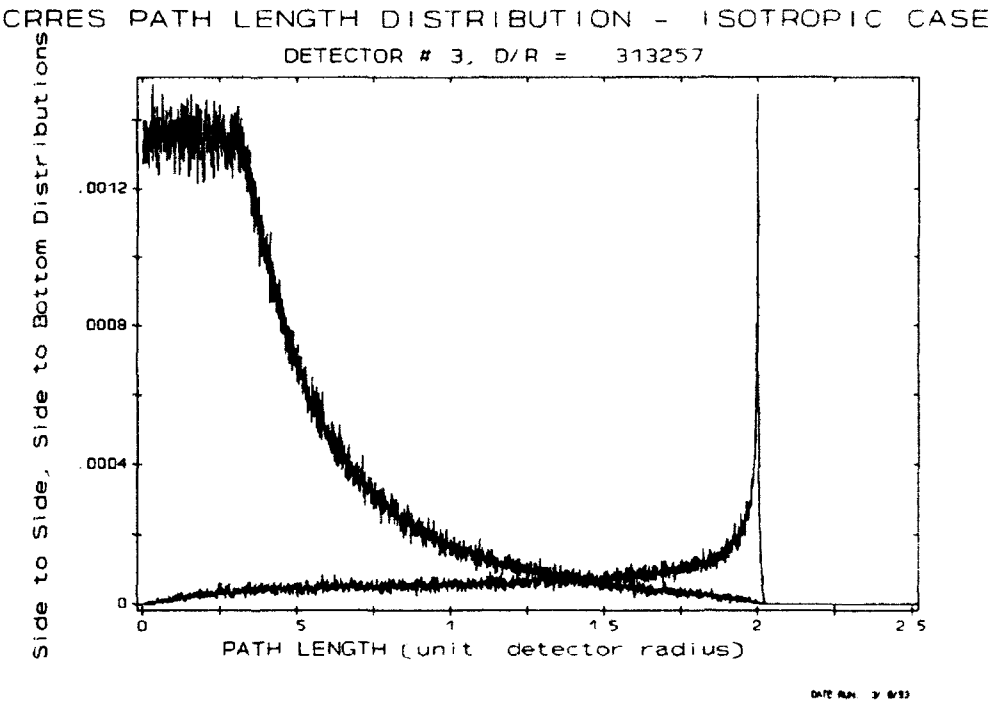

Figure 8.

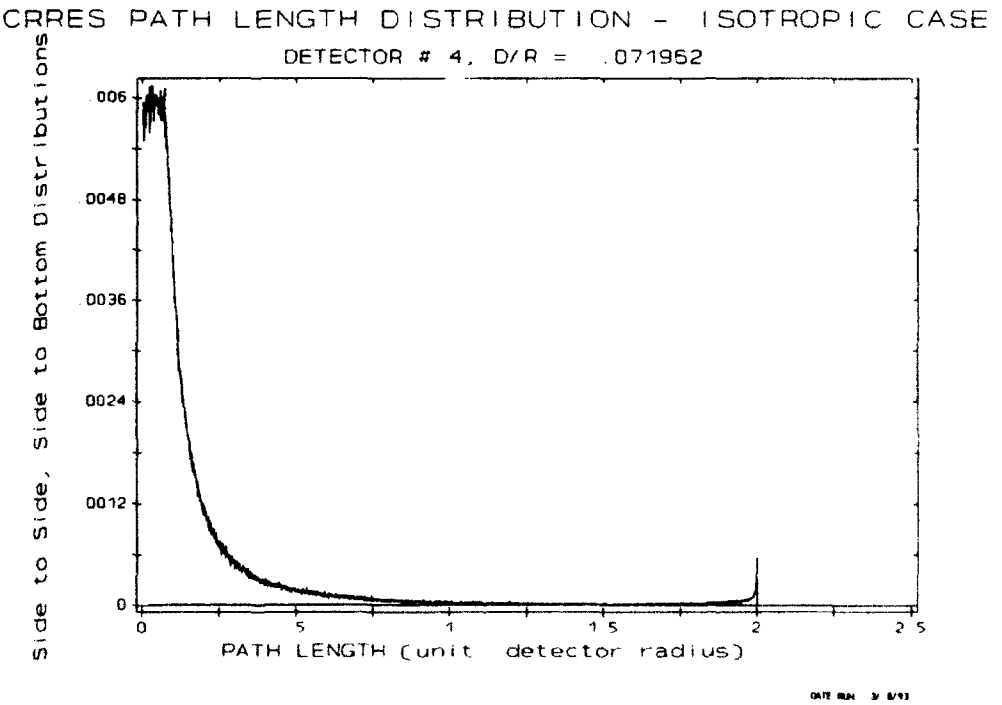

Figure 9.

5.1.3 Complete Isotropic Distribution

To combine the Case 1 and Case 2 Monte Carlo contributions into a single path length distribution, it is necessary to determine the relative path length contributions entering from the top and from the side. For the Case 1 computation, the number of particles striking the top of the detector is proportional to the surface area, πR^2. The Case 2 computation was based upon the contribution due to particles striking the detector along a vertical line on the boundary. The number of particles striking the detector from the side is proportional to $2 \pi D R$, of which only one half of which are moving downwards. The normalized path length distribution P is the weighted sum of the normalized Case 1 and Case 2 contributions T, S, and is given by:

$$P(q) = \frac{T(q) + \frac{D}{R} S(q)}{1 + \frac{D}{R}} \tag{5.1}$$

The complete path length distributions for CRRES Detectors 1-4 are shown in Figures 10 to 13. For comparison, the truncated infinite slab isotropic path length distribution with the same normalization is also displayed. As expected, for small D/R (detector 4) the differences are barely detectable, moderate for detectors 2 and 3 and substantial for detector 1.

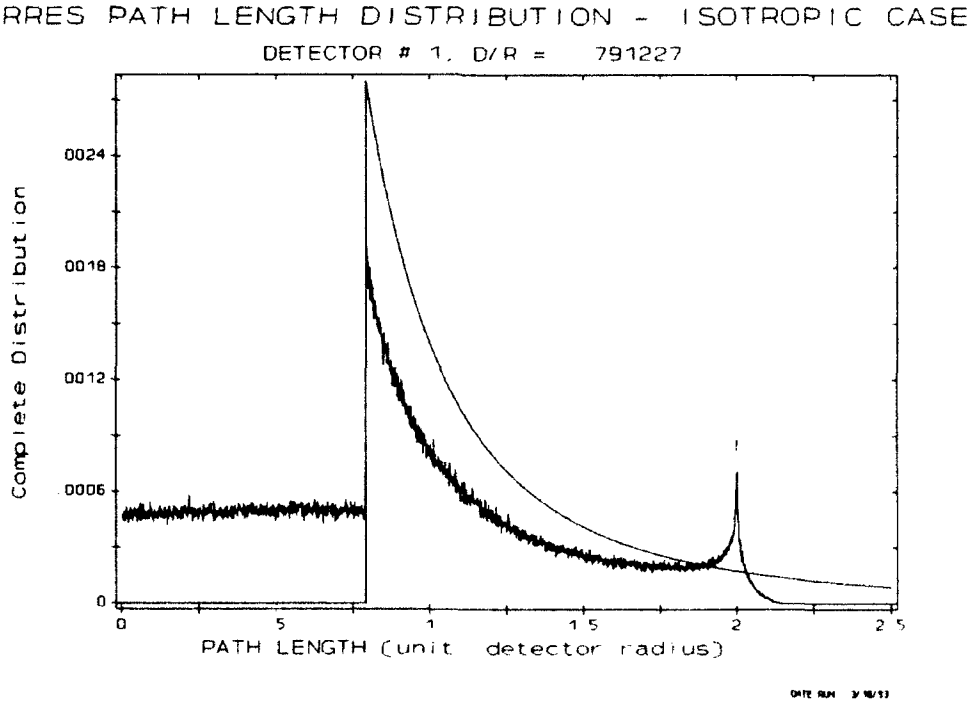

Figure 10.

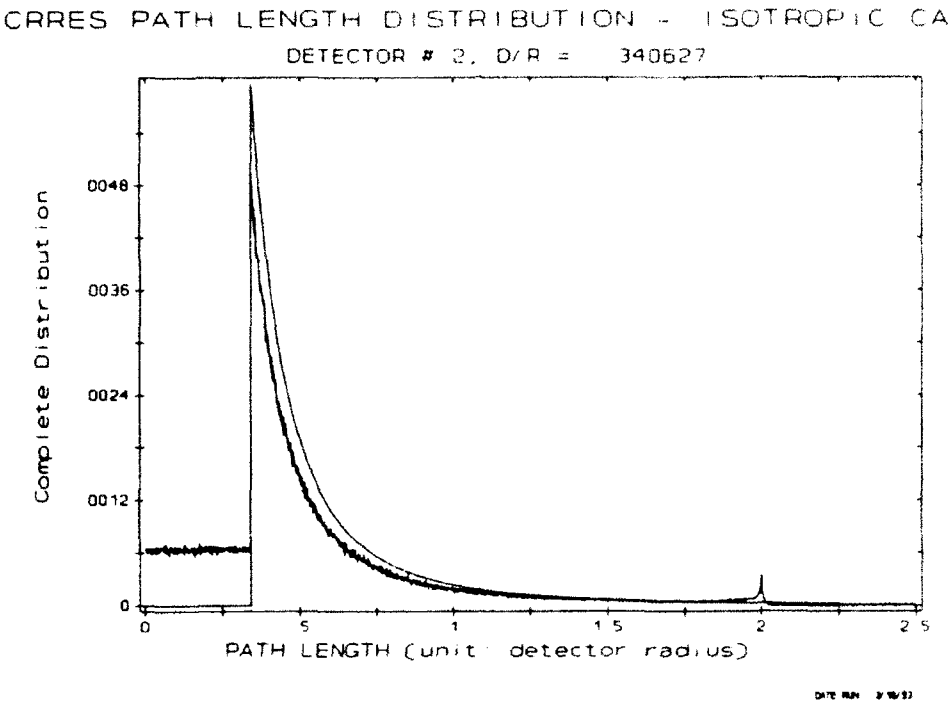

Figure 11.

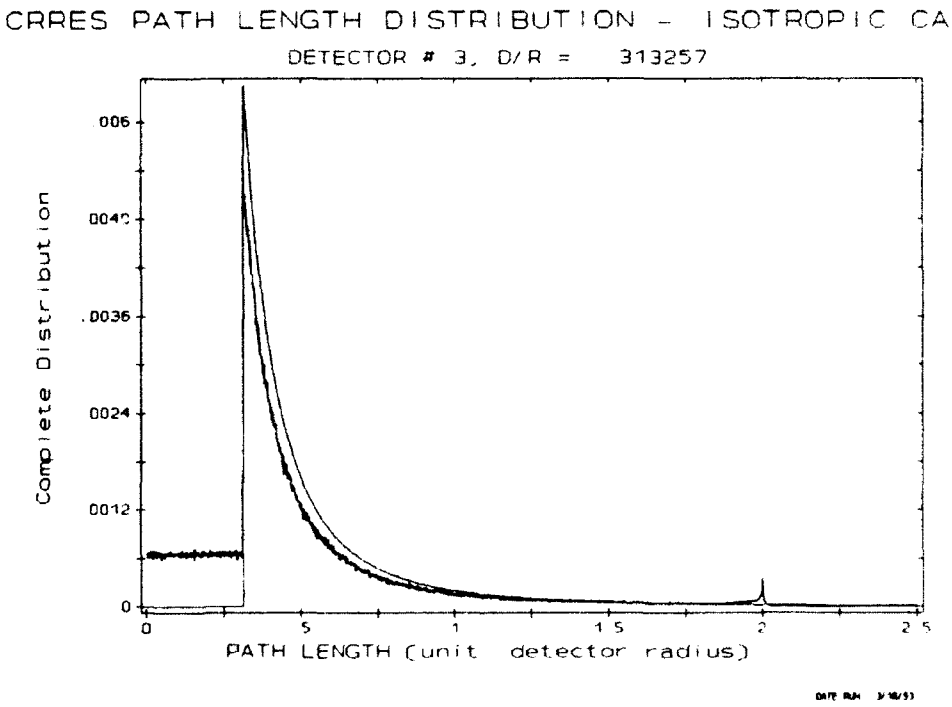

Figure 12.

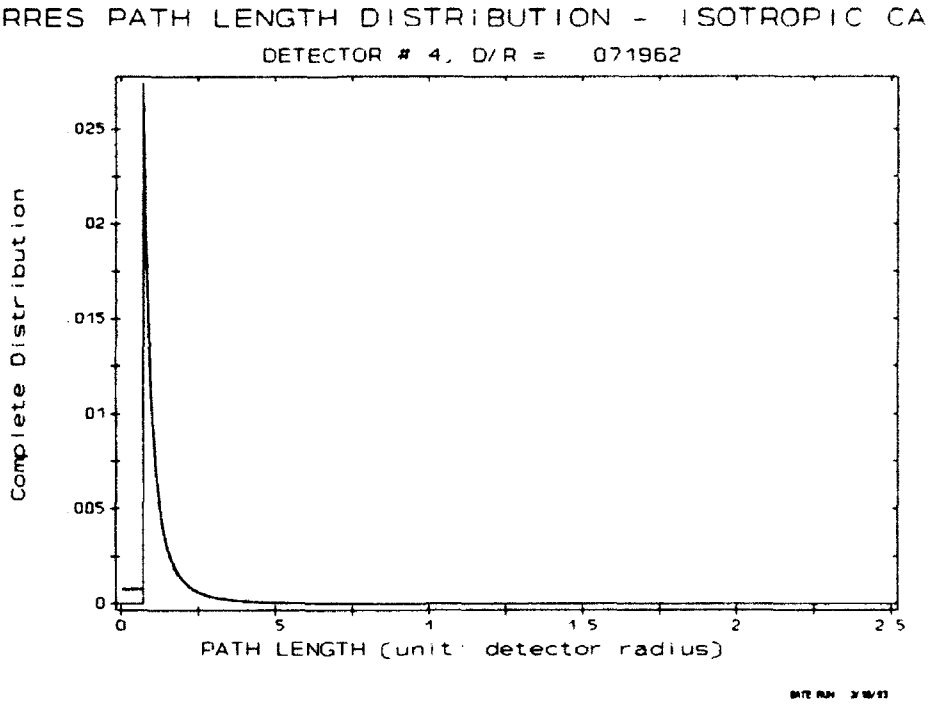

Figure 13.

5.2. MIRROR PLANE PATH LENGTH DISTRIBUTION

Again, as was the case for the Isotropic case, it is convenient to separate the computation of the Mirror Plane Path Length distribution into two parts, corresponding to particle entry from the top, and from the side. For the latter, only downward moving particles are considered; upward moving particles are screened by instrument housing and by the satellite itself.

5.2.1 Case 1: Top to Bottom, Top to Side Computation

The top surface of the detector is described by the set of position vectors $x_t = (x,y,D)$ where $x^2 + y^2 \leq R^2$ (see Figure 1). The bottom surface is described by the set of vectors $x_b = (x',y',0)$ where $x'^2 + y'^2 \leq R^2$. The magnetic field vector is given by $B = B$ (sin λ,0,cos λ). The unit normal to the detector top surface is given by (0,0,1). An arbitrary unit vector u in a plane perpendicular to B (a mirror plane) is given by $u = (\cos\lambda \cos\gamma, \sin\gamma, -\sin\lambda \cos\gamma)$. The path length q from x_t to x_b may be obtained from $x_t - x_t = qu$. The result $q = D/(\sin\lambda \cos\gamma)$ follows from $x' = x + D \cot\lambda$, $y' = y + D \tan\gamma/\sin\lambda$ and $D = -(z' - z) = q \sin\lambda \cos\gamma$. The top-bottom situation requires that both of the conditions $x^2 + y^2 \leq R^2$ and $x'^2 + y'^2 \leq R^2$ must be satisfied.

A Monte Carlo "trial" consists of the following steps: Select a random point (position vector) (x,y,D) on the top surface (with the requirement that equal areas correspond to equal probability). Then select the velocity direction (unit vector) u. For reasons explained in Section 4.2, select sin γ from a uniform probability distribution in the interval [-1, 1]. A trial value of q is computed using the equation $q = D/\sin\lambda \cos\gamma$. The vector $q\,u$ from P in the direction defined by λ and γ is then computed. If the resulting point Q = (x',y',z') satisfied the condition $x'^2 + y'^2 \leq R^2$ then a top to bottom counter corresponding to an interval (bin) for the value of q (for the top-to-bottom case) is incremented.

Otherwise, the quadratic equation in q

$$(1 - \sin^2 \lambda \cos^2 \gamma)\, q^2 + 2\,(x \cos \gamma \cos \lambda + y \sin \gamma)\, q + (x^2 + y^2 - R^2) = 0 \quad . \quad (5\text{-}2)$$

which implements the conditions $x'^2 + y'^2 = R^2$, $0 \leq z' < D$ is solved, and the top to side counter corresponding to q is incremented.

For $\lambda = 0$ there is no top to bottom or top to side contribution because of the sin λ term factor in the flux integral. There is no top to bottom contribution for $\lambda <$ arctan($D/2R$), and the top to side contribution takes on a characteristic form, as shown in Figure 14 for detector 1 at $\lambda = 20$ degrees. For $\lambda \geq$ arctan($D/2R$) the top to side contribution is zero for path lengths $q/R < D$ cotan λ, a sudden jump to its maximum value, and then undergoes a rapid decline to zero at the maximum possible path length q_{max}, as shown in Figure 15 for detector 1 at 25 degrees. The top to side contribution undergoes a rapid decline for $q/R > D$ cotan λ. The top to bottom contribution for larger λ exhibits similar behavior; the top to side contribution is flat up to $q/R = D$ cotan λ and declines rapidly to zero, as is shown in Figure 16 for detector 1 at $\lambda = 60$ degrees.

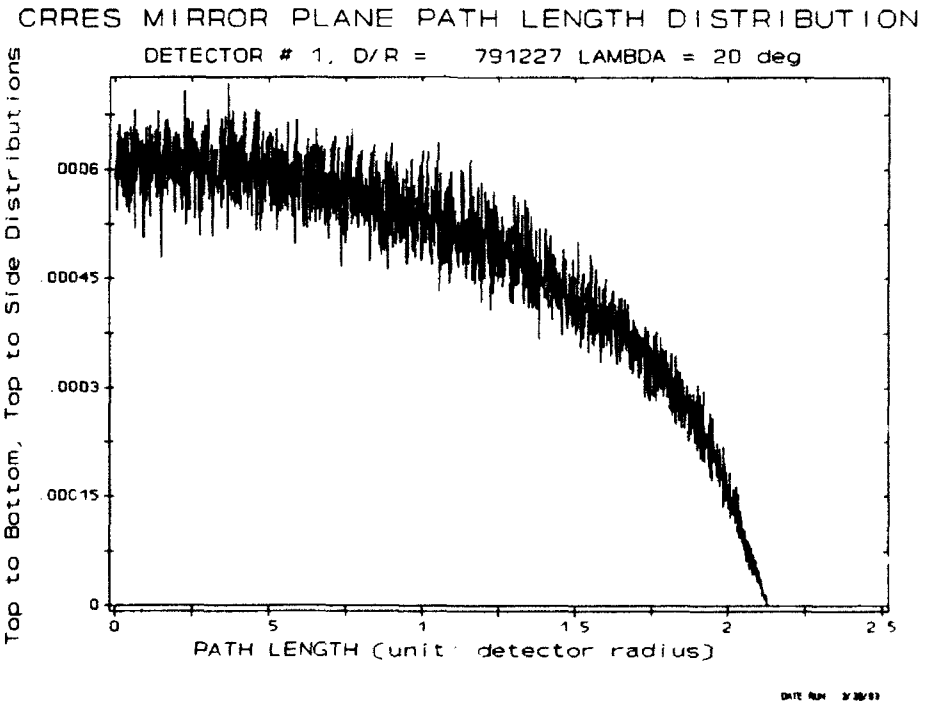

Figure 14.

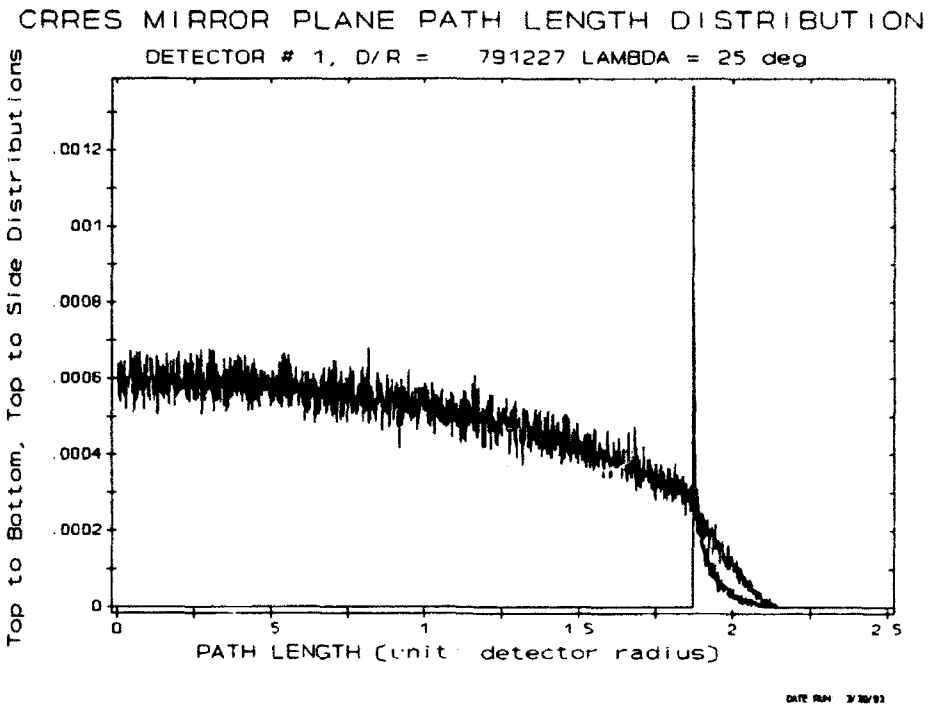

Figure 15.

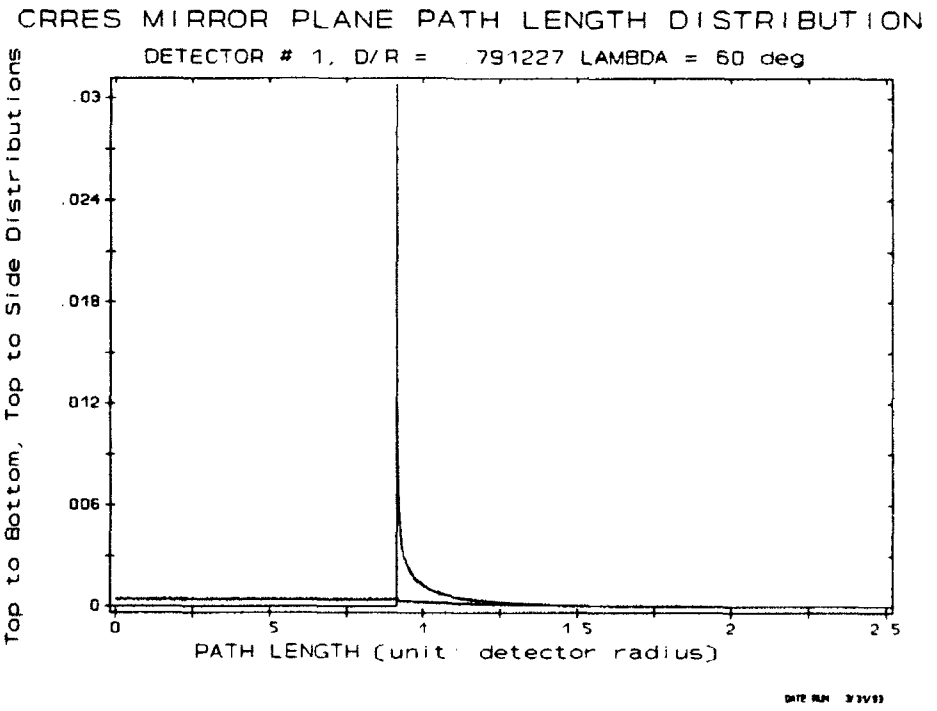

Figure 16.

5.2.2 Case 2: Side to Bottom, Side to Side Contributions

Equation (2.2) is not applicable in this case, since the side of the detector is not a flat surface. The integral over the area must be explicitly be taken into account. The Case 2 contribution to the response function (energy dependent geometric factor) $G_s(E)$ is given by the following integral:

$$G_{side}(E,\lambda) = \int_S dA \int_\Omega d\Omega\ \eta_k(\Omega,E,\ldots)\ \boldsymbol{u}\cdot\boldsymbol{n}\ h(\Omega) \tag{5-3}$$

The element of the detector surface area is given by $dA = R\,d\phi\,dz$, resulting in the following integral:

$$G_{side}(E,\lambda) = R\int_0^D dh \int_{-\pi}^{\pi} d\phi \int_{-\pi}^{\pi} d\gamma\ \eta_k(E,\lambda,\gamma,\phi)\ (\cos\lambda\cos\gamma\cos\phi + \sin\gamma\sin\phi) \tag{5-4}$$

Using trigonometric identities, Equation (5-4) may be rewritten as follows:

$$G_{side}(E,\lambda) = R\int_0^D dh \int_{-\pi}^{\pi} d\gamma \int_{-\pi}^{\pi} d\phi\ \eta_k(E,\theta,\gamma,\lambda)\left[\cos^2\frac{\lambda}{2}\cos(\phi-\gamma) - \sin^2\frac{\lambda}{2}\cos(\phi+\gamma)\right] \tag{5-5}$$

Since equations (5-4) and (5-5) are not separable, it is not possible to use the procedure described at the beginning of Section 4. An alternative Monte Carlo approach for computing the path length distribution is required. Here both γ and ϕ are chosen from uniform distributions. The path length q is then computed and the bin "counter" for q is incremented by $\boldsymbol{u}\cdot\boldsymbol{n}$. An additional counter is required for the number of successful trials.

A single trial proceeds as follows: Select γ and ϕ from uniform distributions in the interval $[0, 2\pi]$, and h from the interval [0, D]. The coordinates of a point on the side of the detector are given by $\boldsymbol{x} = (R\cos\phi, R\sin\phi, h)$. Compute $\boldsymbol{u}$ and $\boldsymbol{u}\cdot\boldsymbol{n}$, reject the trial if $\boldsymbol{u}\cdot\boldsymbol{n} < 0$ or if u_z, the z component of $\boldsymbol{u} > 0$ (upward moving particles are screened by the spacecraft and instrument housing). Using a trial value of $q = h/\sin\lambda\cos\gamma$, compute $\boldsymbol{x}' = \boldsymbol{x} + q\,\mathrm{u}$. If $\boldsymbol{x}'\cdot\boldsymbol{x}' < R^2$, increment the side-bottom counter by $\boldsymbol{u}\cdot\boldsymbol{n}$. Otherwise, compute $q = 2R\,\boldsymbol{u}\cdot\boldsymbol{n} / (1 - \sin^2\lambda\cos^2\gamma)$ and increment the side-side counter by the same amount.

The Case 2 path length distribution will be the sum of the side-bottom and the side to side contributions divided by the number of successful trials, and, for a particular path length q represents the contribution to the average value of $\boldsymbol{u}\cdot\boldsymbol{n}$ for the path lengths in the bin for the successful trials.

The results of the Side to Bottom and Side to Side computations are shown graphically in Figures 17 to 19 for detector 1 for λ = 20, 25 and 60 degrees. The side to side component has a sharp peak at $q = 2R$, and is present for all values of λ. There is no side to side "tail" (contribution) for $q/R > 2$ at $\lambda = 0$, and the tail "grows" towards q_{max} as λ increases up to arctan($D/2R$). The side to bottom component decreases slowly as q increases from 0 to D cotan λ, and then rapidly decreases to 0.

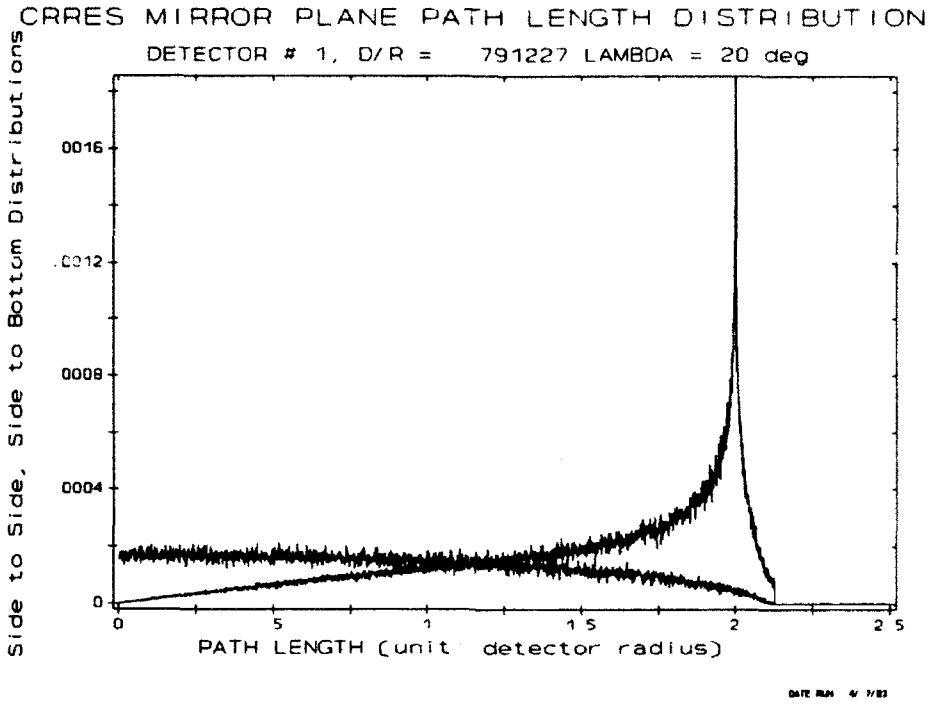

Figure 17.

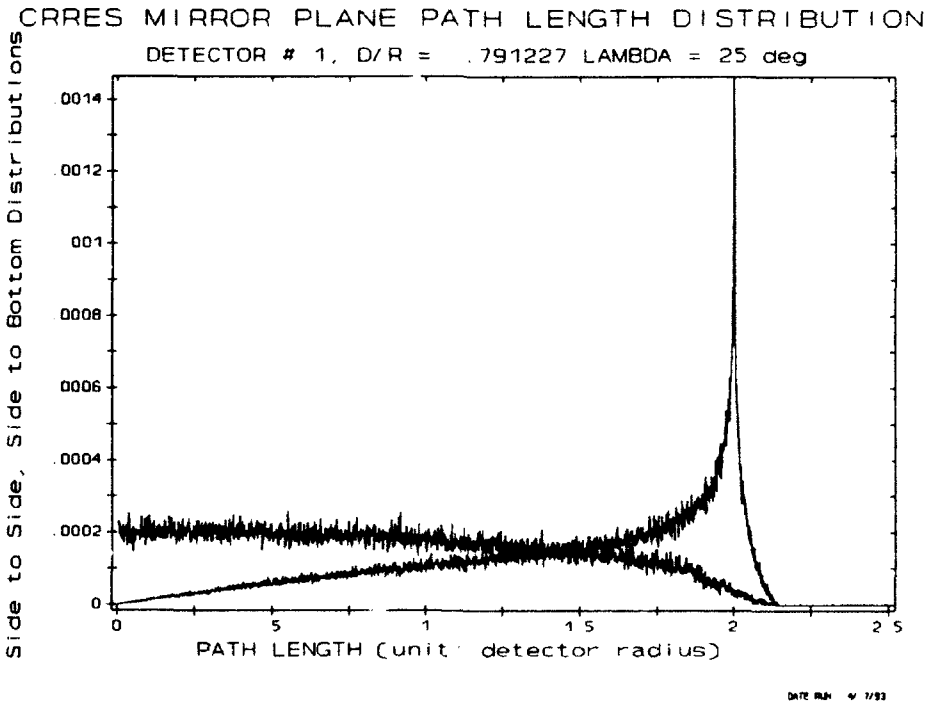

Figure 18.

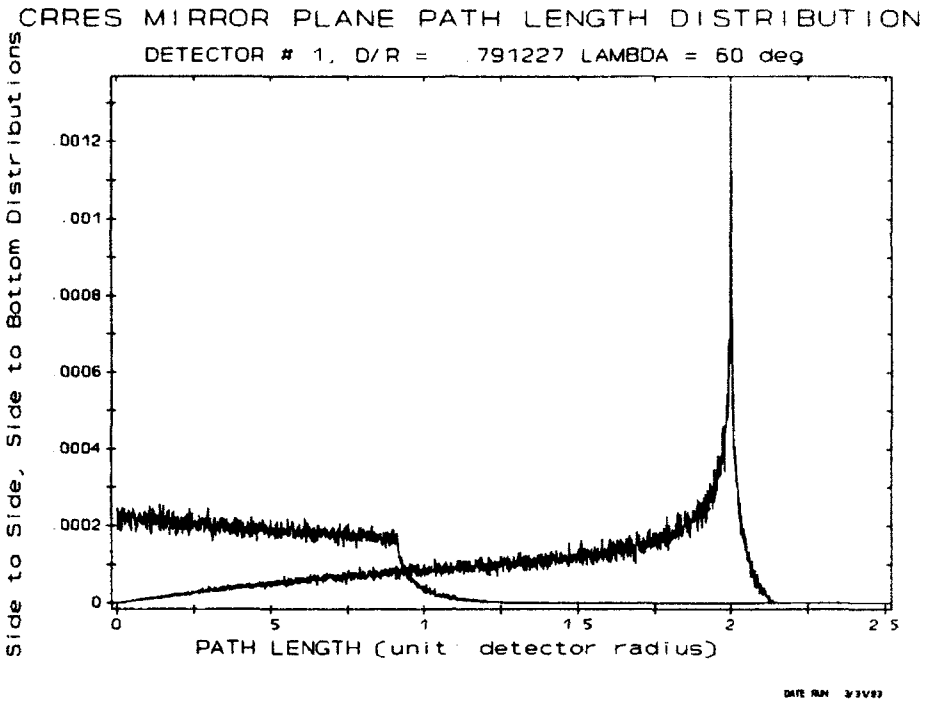

Figure 19.

5.2.3 Complete Mirror Plane Path Length Distribution

The complete path length distribution is obtained by considering the response function as a weighted sum of the Case 1 and Case 2 contributions, each of which may be expressed as an integral of the form Eq. (4-3). For Case 1, since the top surface is flat, the integral over the area may be performed directly, leaving the result

$$G_{t,k}(E,\lambda) = \pi R^2 \sin\lambda \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \eta_k(E,\gamma,\ldots) \cos\gamma \, d\gamma \qquad (5\text{-}6)$$

The path length distribution for Case 1 is normalized, that is, the integration over path length is equal to 1. This corresponds to setting $\eta_k = 1$, resulting in $2\pi R^2$ for the integral (4.3), and the contribution due to a particular path length q is given by $2\pi R^2 T(q)$ where T is the Case 1 component of the path length distribution.

For Case 2, the corresponding integral is given by Equation (5-4) or (5-5). For a given path length q, the computed value of the path length distribution $S(q)$ is the contribution to the integral $\boldsymbol{u} \bullet \boldsymbol{n}$ for path lengths in the bin, and the sum of the path length distribution represents the average value of $\boldsymbol{u} \bullet \boldsymbol{n}$ from which we conclude that, since the ranges of integration for γ and ϕ are $[0, 2\pi]$, it follows that:

$$\frac{N_{successful}}{N_{total\ trials}}_{q} \qquad S(\lambda,q) = \frac{1}{4\pi^2} \int u \cdot n \, d\gamma \, d\phi \tag{5-7}$$

The above result takes into account the fact that both upward directed particles and particles for which $u \bullet n < 0$ are rejected. The range of the integral on the right hand is only over the ranges for γ and ϕ corresponding to successful trials. Computationally, the ratio of successful to total trials, is very close to 1/4. From this result, it follows that the path length distribution P and the response function G are given by:

$$P(\lambda,q) = \sin\lambda \; T(\lambda,q) + \frac{\pi D}{2R} \; S(\lambda,q)$$

$$G_k(\lambda,E) = 2A \int \eta_k(E,q,...) \; P(\lambda,q) \; dq \tag{5-8}$$

The resulting path length distributions for detector 1 at λ = 20, 25 and 60 degrees are provided in Figures 20 to 22.

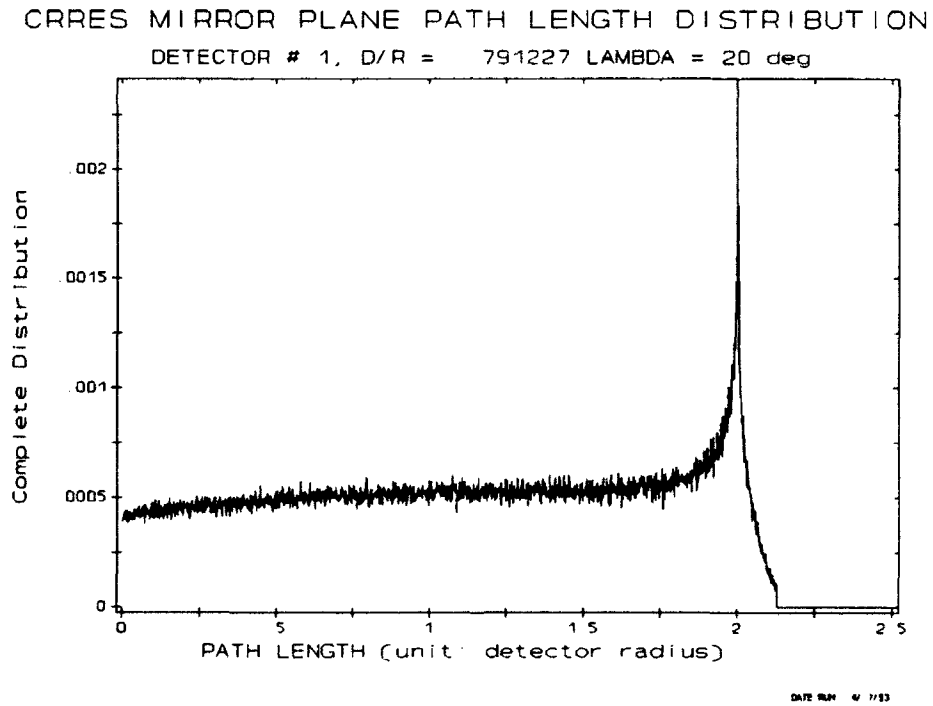

Figure 20.

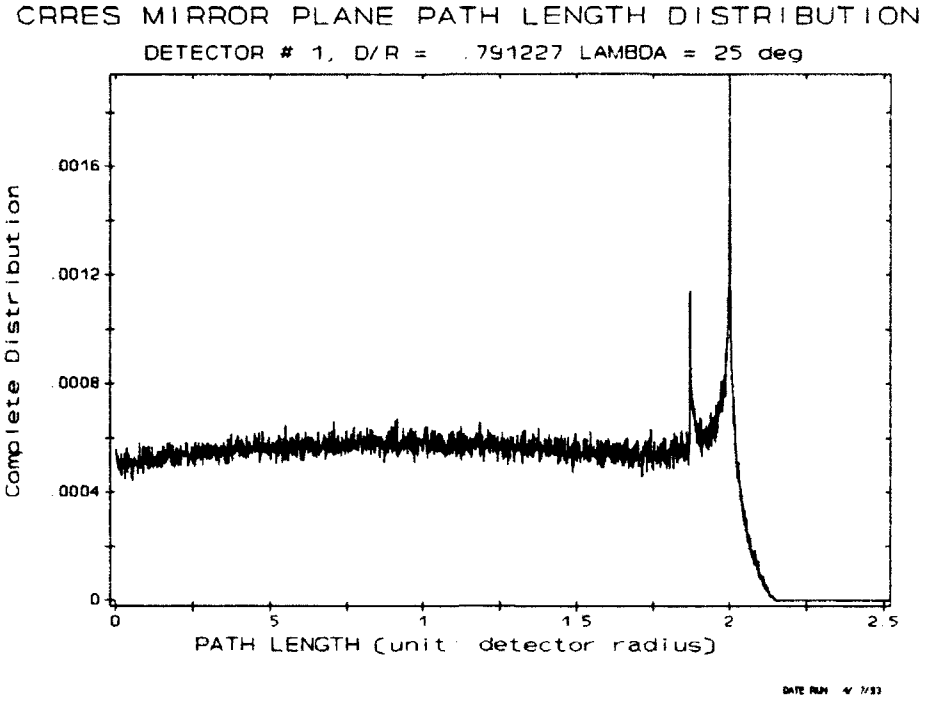

Figure 21.

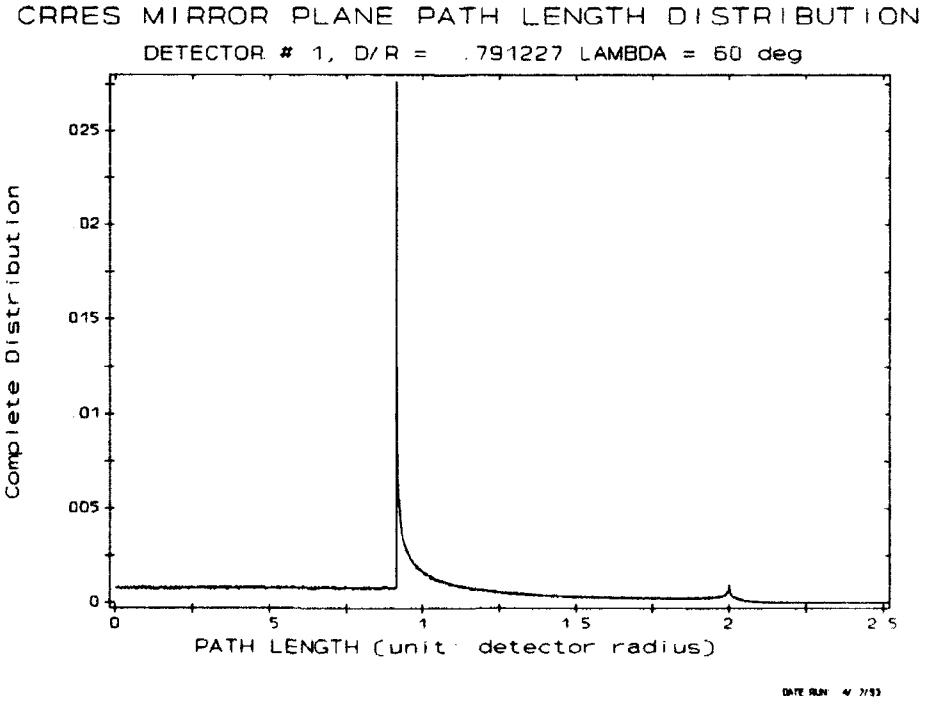

Figure 22.

5.3 $\mathrm{Sin}^N(\alpha)$ PITCH ANGLE DISTRIBUTION

Here again the computation is split into two cases, the first for protons entering from the top, and exiting through the bottom or the side, and the second for protons entering the side, and exiting through the side or bottom.

5.3.1 Case 1: Top to Bottom, Top to Side Contributions

We shall now attempt to apply the procedure described in Section 4 for the $\sin^N \alpha$ pitch angle distribution top entry case. The unit vector $\boldsymbol{u}$ in the velocity direction is given by:

$$\boldsymbol{u} = \cos\alpha\, \boldsymbol{b} + \sin\alpha\, \boldsymbol{c} \text{ where } \boldsymbol{b} = (-\sin\lambda, 0, -\cos\lambda) = -\frac{\boldsymbol{B}}{B}, \quad \text{and } \boldsymbol{c} = (\cos\lambda\cos\gamma, \sin\gamma, -\sin\lambda\cos\gamma) \tag{5-9}$$

is a unit vector in the plane orthogonal to **B**. Note that for the Mirror Plane case **u** = **c** was used. The normal to the detector surface is given by $\boldsymbol{n} = (0,0,1)$. The resulting expression for dG is as follows:

$$dG_t(E,\lambda) = \sin^N\alpha\,(\cos\alpha\cos\lambda + \sin\alpha\sin\lambda\cos\gamma)\, d\Omega \tag{5-10}$$

Here we may set $d\Omega = d\gamma\, d\cos\alpha$; here γ is the so-called phase angle. This expression is clearly separable *only* for the cases $\lambda = 0$ and 90 degrees, where the distributions for γ are $d\gamma$ and $d\sin\gamma$ respectively.

Since dG is not separable, we may use a Monte Carlo approach which is similar to that used for the Side entry case for the Mirror Plane distribution. The top entry contribution to the response function is given by the following integral:

$$G_{top,k}(E,\lambda,..) = \frac{\int_0^R \rho\, d\rho \int_{-\pi}^{\pi} d\phi \int_{-\pi}^{\pi} d\gamma \int_0^{\pi} d\alpha\, h(\alpha)\sin\alpha\, \boldsymbol{u}\cdot\boldsymbol{n}\, \eta_k(E,\ldots)}{\int_0^{\pi} h(\alpha)\sin\alpha\, d\alpha} \tag{5-11}$$

where $h(\alpha) = \sin^N\alpha$. The integral in the denominator is required for the normalization of the pitch angle distribution (weighted by $\sin\alpha$). Expressing the above result in terms of a Monte Carlo summation, we obtain

$$G_{top,k}(E,\lambda,\ldots) = \frac{R^2}{2}\, 4\pi^2\, \frac{\sum_i h(\alpha_i)\, \sin\alpha_i\, (u \cdot n)_i\, (\eta_k(E,\ldots))_i}{\sum_i h(\alpha_i)\, \sin\alpha_i} \tag{5-12}$$

Where the summation is over the Monte Carlo trials. Sorting the trials into path length bins, and using the fact that η_k depends only upon the path length and incident energy, it follows that

$$G_{top,k}(E,\lambda,\ldots) = A \sum_q T(\lambda,q)\, \eta_k(E,q)$$

where

$$T(\lambda,q) = \frac{2\pi \sum_{i,\, q_i \in B(q)} h(\alpha_i)\, \sin\alpha_i\, (u \cdot n)_i}{\sum_i h(\alpha_i)\, \sin\alpha_i}. \tag{5-13}$$

Where A is the area of the top detector surface and $B(q)$ is the bin corresponding to q.

For a given value of N and λ, the procedure for a single Monte Carlo trial is as follows: Select a point on the top surface of the disk $x = (x,y,D)$, assigning equal weights to equal areas. In polar coordinates, this is accomplished by picking a random number w from a uniform distribution in [0, 1] and θ from a uniform distribution in $[0, 2\pi]$, and selecting $r = R\sqrt{w}$, and $x = r\cos\theta$, $y = r\sin\theta$. Then select α and γ from uniform distributions in the intervals $[0, \pi]$ and $[-\pi, \pi]$ respectively. Compute the unit vector in the direction of the velocity u. Compute $u \cdot n = -u_z$; if $u_z > 0$, reject the trial, otherwise compute $\sin^N \alpha$. Assuming $q = D/u_z$, (top-bottom case), compute $x' = (x',y',z') = x + q\,u$. If $x'^2 + y'^2 \le R^2$, then increment the top-bottom counter for q by $-\sin^{N+1}\alpha\; u \cdot n$, the normalization counter by $\sin^{N+1}\alpha$, and the "successful trial" counter by 1. Otherwise, solve the quadratic equation

$$(1 - u_z^2)\, q^2 + 2\,(x\,u_x + y\,u_y)\, q - (1 - x^2 - y^2) = 0$$

for q, and compute $x' = x + q\,u$. If $z' > 0$, increment the top-side counter for q by $-\sin^{N+1}\alpha\; u \cdot n$, the normalization counter by $\sin^{N+1}\alpha$, and the "successful trial" counter by 1.

5.3.2 Case 2: Side to Bottom, Side to Side Contributions

The side entry contribution to the response function is given by the following integral:

$$G_{side,k}(E,\lambda,\ldots) = \frac{\int_0^D dz \int_{-\pi}^{\pi} R\, d\phi \int_{-\pi}^{\pi} d\gamma \int_0^{\pi} d\alpha\, h(\alpha) \sin\alpha \;\; u \cdot n\, \eta_k(E,\ldots)}{\int_0^{\pi} h(\alpha) \sin\alpha} \tag{5-14}$$

Expressing the above result in terms of a Monte Carlo summation, we obtain:

$$G_{side,k}(E,\lambda,\ldots) = R\, D\, 4\, \pi^2 \frac{\sum_i \sin\alpha_i\, (u \cdot n)_i\, (\eta_k(E,\ldots))_i}{2 \sum_i h(\alpha_i) \sin\alpha_i} \tag{5-15}$$

The factor of 2 in the denominator arises from the Monte Carlo computation, in which only successful trials are considered in both the denominator and numerator, and the fact that half of the α values will be rejected. Again, sorting the trials into path length bins, and using the fact that η_k depends only upon the path length and incident energy, it follows that

$$G_{side,k}(E,\lambda,\ldots) = R\, D \sum_q S(\lambda,q)\, \eta_k(E,q)$$

where

$$S(\lambda,q) = \pi \frac{\sum_{i,\, q_i \in B(q)} h(\alpha_i) \sin\alpha_i\, (u \cdot n)_i}{\sum_i h(\alpha_i) \sin\alpha_i} \tag{5-16}$$

The Monte Carlo calculation proceeds in the same manner as for the side entry case for the mirror plane distribution (Section 5.2.2), except for weighting $u \bullet n$ by $h(\alpha) \sin\alpha$, use of the additional normalization counter, and that u is defined by Equation 5-9.

5.3.3 Complete $\mathrm{Sin}^N \alpha$ Pitch Angle Path Length Distribution

Defining the path length distribution by:

$$P(\lambda,q) = T(\lambda,q) + \frac{D}{R} S(\lambda,q)$$

we obtain

$$G(E,\lambda) = A \sum_q P(\lambda,q)\ \eta_k(E,q).$$

5.3.4 Comparison of Mirror Plane and $\mathrm{Sin}^N \alpha$ Pitch Angle Path Length Distribution for Large N

The Mirror Plane distribution is the large N limit of the $\mathrm{Sin}^N \alpha$ path length distribution; as a result, we should expect to find that the corresponding path length distributions should be similar. As a check on these computations, comparison of the mirror plane path length distributions and the N = 999 pitch angle have been made at 0, 30, 60 and 90 degrees. Geometric factors have also been computed for power law spectra, tables of which are provided in Section 7. The N = 999 case does exhibit significant differences from the mirror plane case, particularly at $\lambda = 0$ for detector 4, and at 30 degrees for detector 1. For $\lambda = 0$, the only contributions to the mirror plane path length distribution are from the side to side component. For the N = 999 case there are no top-bottom contributions for detectors 1-3, but there is a noticeable contribution for detector 4. Small top to side contributions are present for all detectors. The side to side contribution is the most prominent, but there is a significant side to bottom component for detector 4, resulting from low angle grazing particles (Note: $.5 < \sin^{999} \alpha$ for $87.9 < \alpha < 92.1$ degrees). As a result, the LOLET contributions for detector 4 are an order of magnitude greater than is the case for the mirror plane distribution. The side-entry contributions for detector 4 at $\lambda = 0$ for the mirror plane and N = 999 side entry contributions are shown in Figures 23 and 24 [The normalization of the latter is twice that of the former]. The side to bottom component for the latter, and a small top to side contribution (not shown) appear to be responsible for the LOLET order of magnitude increase and the significant HILET differences found in the geometric factors for this detector.

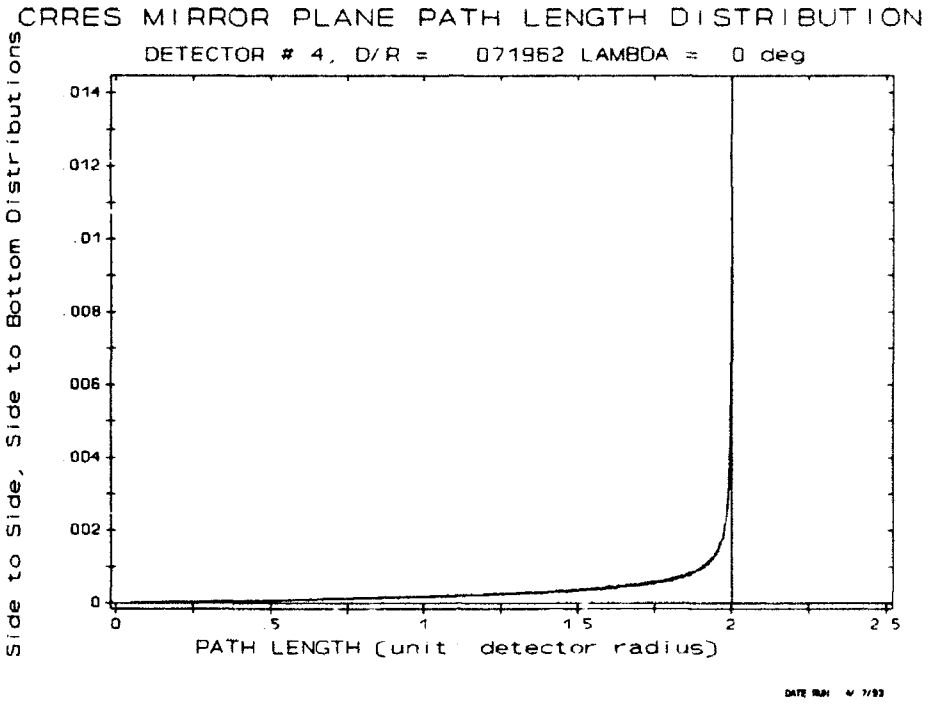

Figure 23.

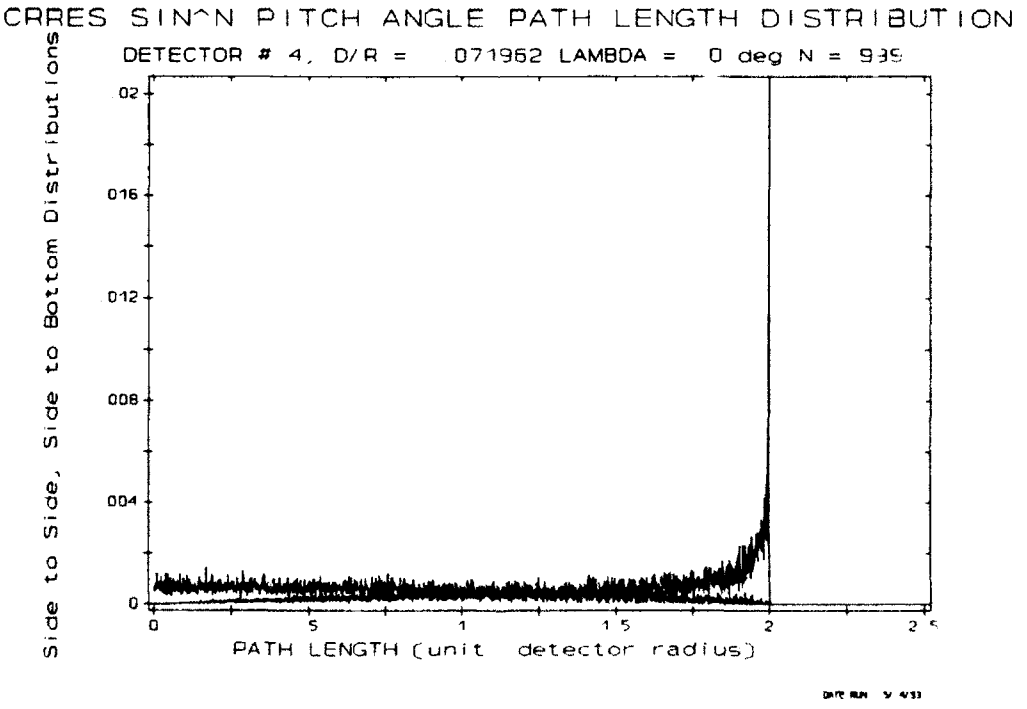

Figure 24. $Sin^{999}\ \alpha$ Pitch Angle Distribution

6. RESPONSE FUNCTION CALCULATIONS

The DMSP and CRRES dosimeter detectors are solid state detectors, composed mostly of silicon. They detect the passage of a particle (charged particle or photon) by the ionization produced when the particle passes through the detector. The detectors usually have thin conducting layers on the top and bottom surfaces, and form a capacitor. A voltage is applied to the capacitor, and the passage of the particle through the detector results in a momentary current (pulse) which is related to the energy loss experienced by the particle in its passage through the detector. The current produced (the pulse height) is then measured, and the detector's electronic components report the estimated energy loss.

Each of the CRRES dosimeter detectors consist of a hemispherical aluminum housing which is used to exclude charged particles with energies below a certain threshold limit. At the center of the hemispheric shell is a silicon detector. Except for a portion of the CRRES detector # 1, the active region of the detectors is a circular disk. The "dead" region bounding the disk is not modeled. The energy deposited in its active region by high energy ions is measured, and the flux and dose counts are reported as follows: There are three ranges (channels) to which the instruments respond, LOLET (energy depositions of 0.05 - 1 MeV), HILET (energy depositions of 1 - 10 MeV), and star events (energy depositions greater than 20 MeV).

The computation of the Dosimeter flux and dose channel response functions proceeds as follows: For a given incident proton energy E, the energy E' remaining after passage through the aluminum hemispheric shield is computed using the Janni Range-Energy tables for Aluminum [*Janni*, 1982]. Then the flux and dose channel integrals are computed for protons of energy E' incident on the detector. These calculations are repeated for each value of energy of interest, and function of energy obtained in this manner is called the response function.

Different methods and approximations are used to compute the integrals. In this section, the different methods and approximations are described, and the response functions obtained using these methods is provided in graphical form.

6.1 ISOTROPIC CASE

For an isotropic distribution the energy dependent geometric factor or the response function for the k'th channel is an integral of the form:

$$G_k(E) = \int_S dA \int_\Omega \eta_k(\Omega, E)\, u \cdot n \, d\Omega \qquad (6.1)$$

over solid angle where η_k is the detector efficiency function, S is the surface of the detector. For the dosimeter flux channels, the detector efficiency function takes on the value 1 or 0, 1 if the energy deposited by a proton in the active region of the detector lies within the range of 0.05 - 1 MeV for the LOLET channel, and 1-10 MeV for the HILET channel, otherwise 0. For the dose channels, the efficiency function takes on a value between 0 - 15, depending upon the amount of energy deposited in the detector for the appropriate LOLET and HILET channels. The tables used for the DMSP and CRRES dose channels are taken from *Sellers, et al.* [1981] and *Morel, et al.* [1989] respectively.

For the infinite slab approximation, the flux and dose count integrals have been computed analytically

using a method described in *Gussenhoven et al* [1986]. In this method, the bare detector response function is computed for a detector having a one cm^2 surface area and a 400 micron thickness. The energy - range relation of *Bischel and Tschalaer* [1967]: R[silicon] = 11.824 $E^{1.772518}$, E in MeV, R in microns was used, and was used in the computations presented here. The value of the response function for incident external E is obtained by computing the remaining energy after passage through the hemispheric dome E', evaluating the bare detector response for E', and multiplying by the area of the detector.

As a check upon the Monte Carlo methods used for computing the path length distributions, a Monte Carlo calculation of the bare detector response function was also performed, with identical results to those obtained by the analytic method. Figures 25 and 26 provide graphs of the bare detector flux and dose repsonse functions obtained from the Monte Carlo calculation. The graphs represent 100,000 trials per energy value, which was computed at 0.001 MeV intervals between 0.05 and 1.0 MeV, 0.01 intervals between 1 and 10 MeV, 0.1 intervals between 10 and 100 MeV, and 1.0 intervals between 100 - 1010 MeV.

In addition, direct Monte Carlo computations of the detector response functions were also performed. The Monte Carlo Infinite Slab Approximation Response Functions for CRRES Detector 1 are provided in graphical form in Figures 27 and 28 for flux and dose respectively. For the dose graph, the dose count is multiplied by the average energy loss/count. Not visible on the graphs is a narrow spike in the Lolet channel at the energy threshold. A characteristic of the infinite slab approximation is minimum path length, which, for the isotropic case, is the detector thickness. This is evident in the graphs by the gap between the onset of Hilet response and Lolet response. Another characteristic, the lack of path length cutoff, is evidenced by the lack of a cutoff in the Hilet response.

To avoid numerical problems for the direct calculation of the geometric factor for power law spectra, an integration step size of 0.001 MeV for an interval of about 0.25 MeV around the threshold energy was used, an interval of 0.01 used up to 5 MeV above the threshold, 0.1 up to 100 MeV and 1.0 up to 1000 MeV. The maximum difference for the geometric factors using the Monte Carlo approach and the analytic computation was about 2%.

Figures 29 and 30 are the corresponding graphs for the Truncated Infinite Slab Approximation for Detector 1, in which the path lengths longer than $q_{max} = \sqrt{(4R^2 + D^2)}$ are excluded. The resulting path length distribution is renormalized. The cutoff in the Hilet response reflects the absence of path lengths longer than q_{max}. The energy offset between the HILET and LOLET response reflects the absence of path lengths shorter than the detector thickness.

Figures 31 and 32 are the corresponding graphs for the Path Length Distribution Computation for Detector 1. Note the Hilet cutoff, and the lack of an offset between the HILET and LOLET response. The graphs for detectors 2 - 4 are not included here; they are similar, but differ in the location of the threshold energy and the HILET cutoff. For Detector 4 (not shown) the HILET cutoff is beyond 1000 MeV.

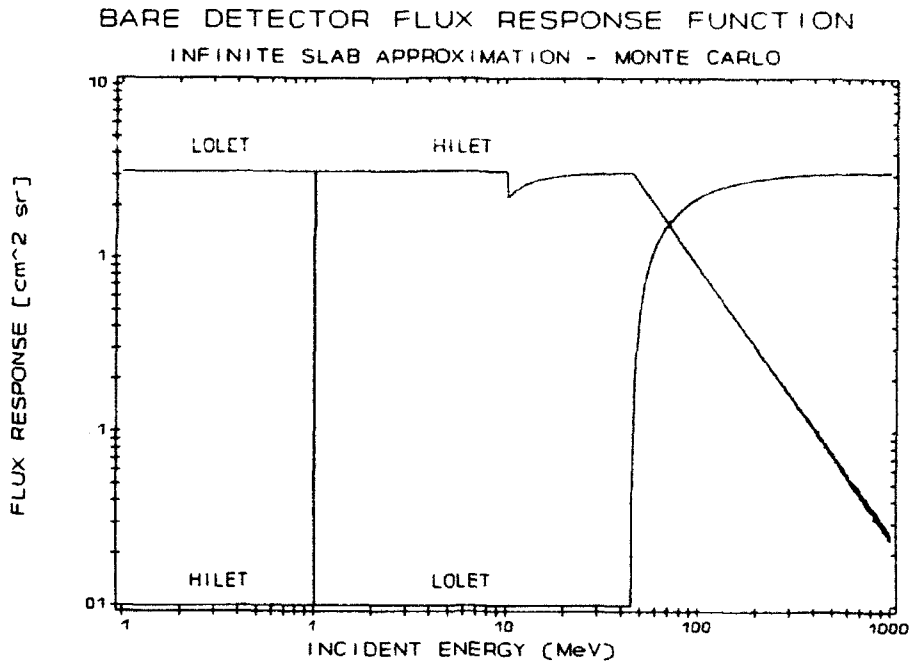

Figure 25.

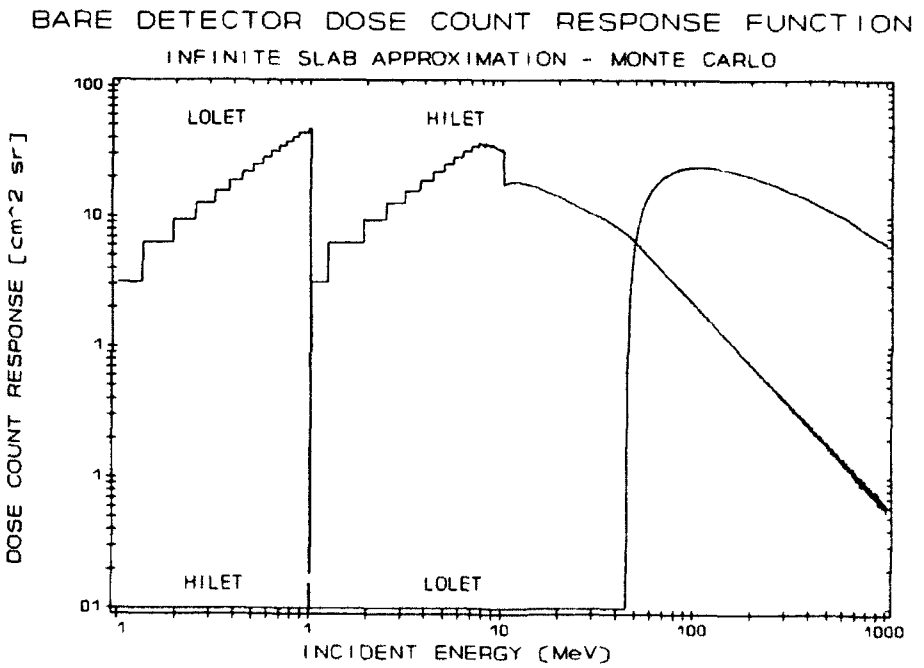

Figure 26.

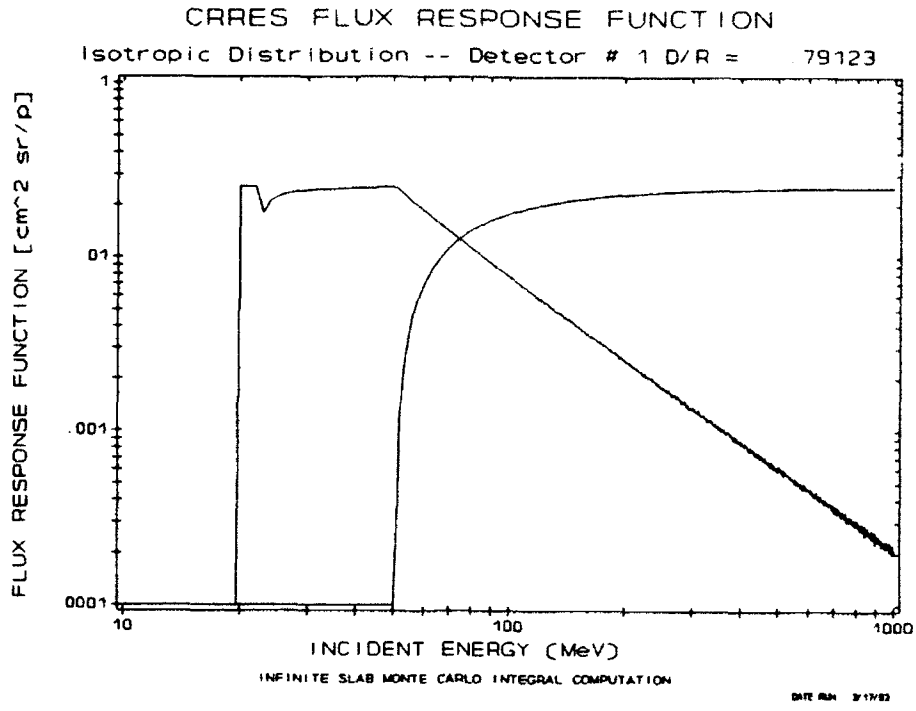

Figure 27.

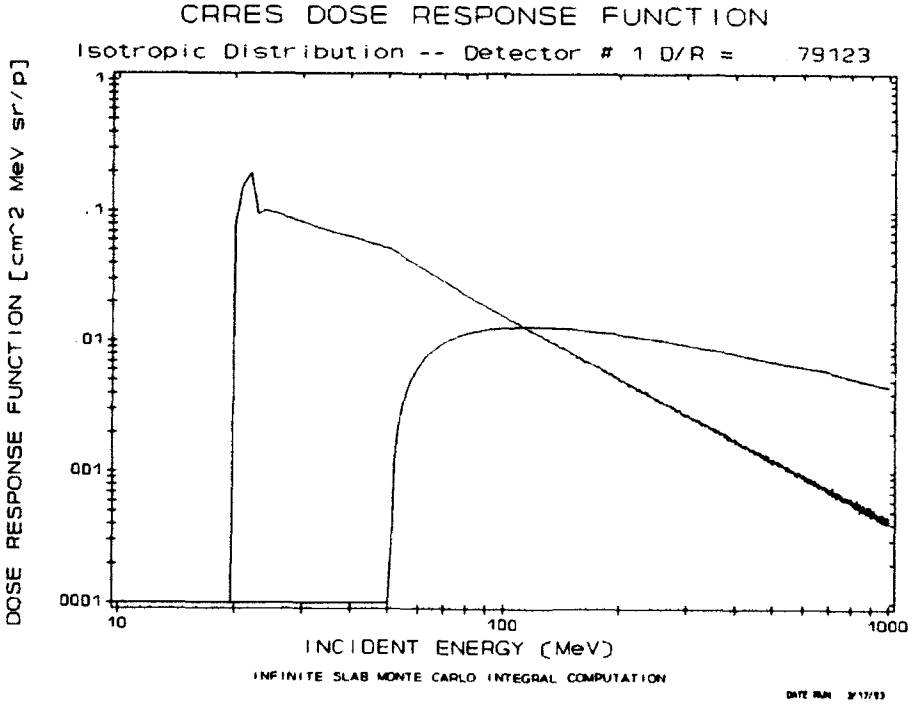

Figure 28.

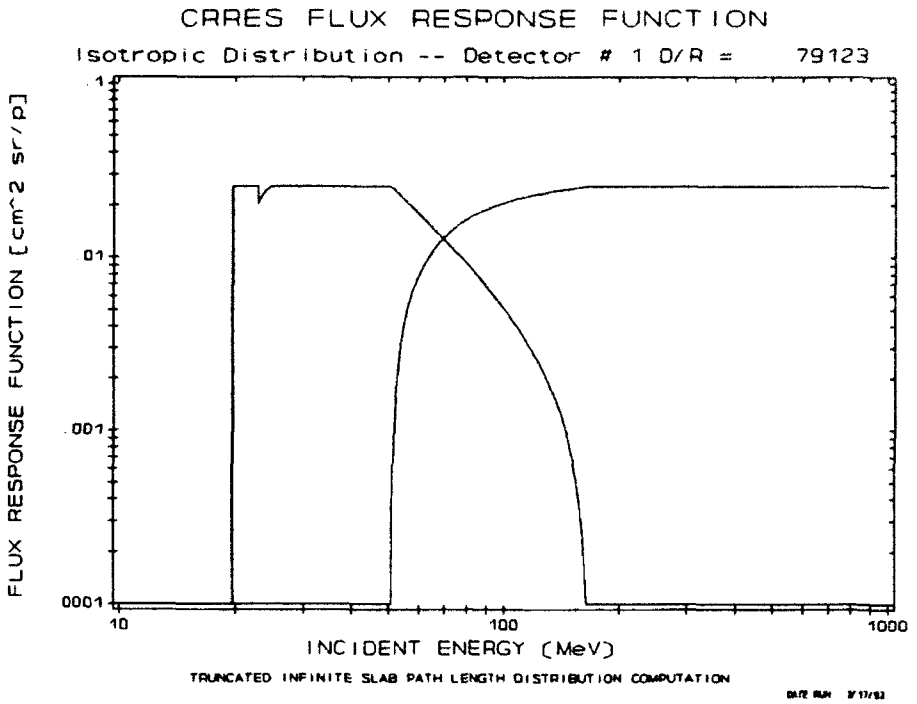

Figure 29.

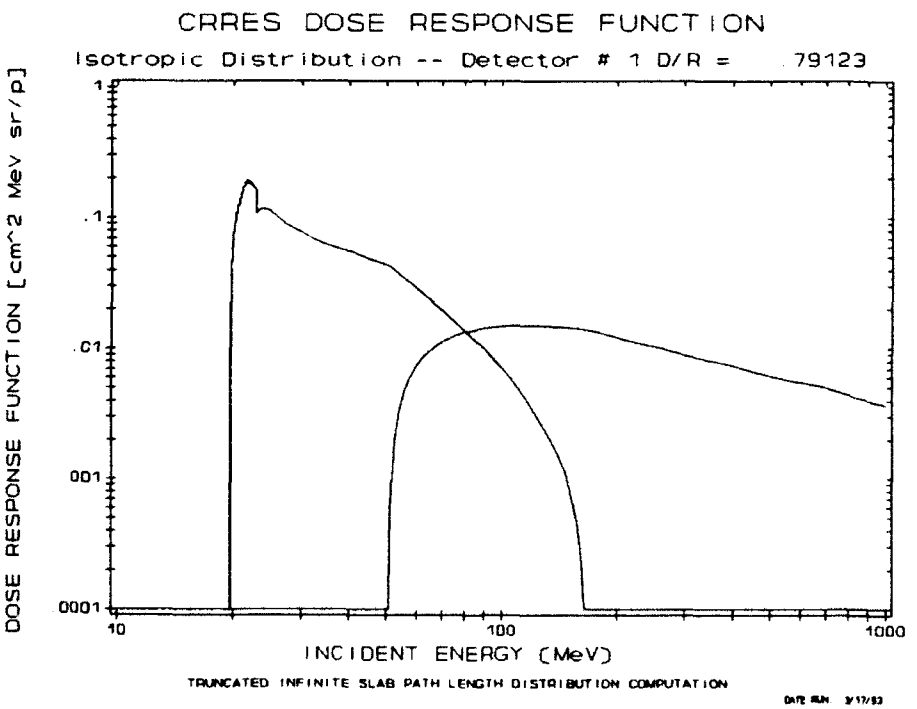

Figure 30.

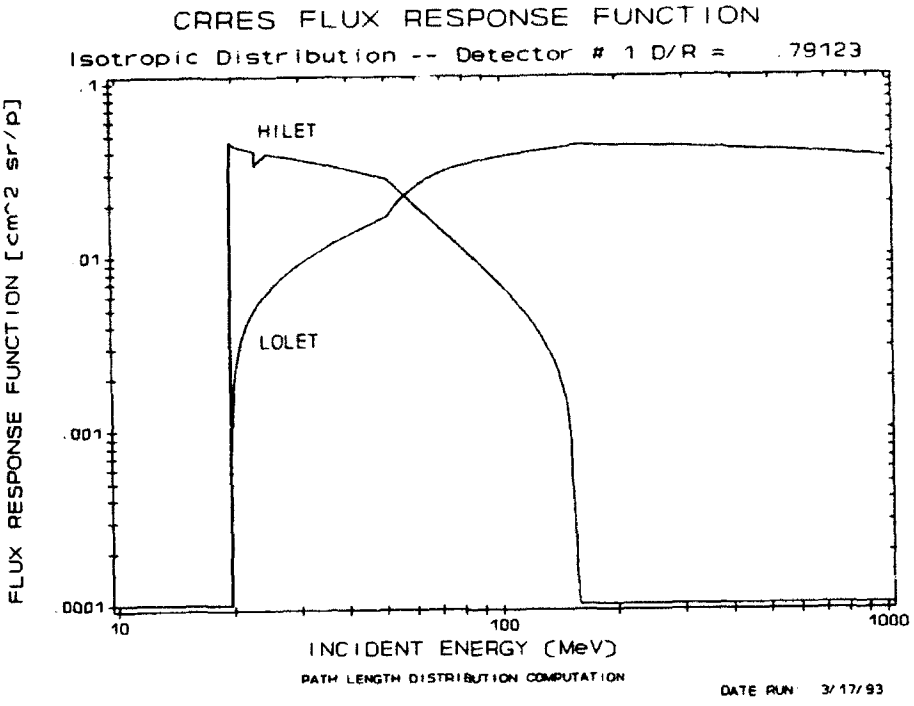

Figure 31.

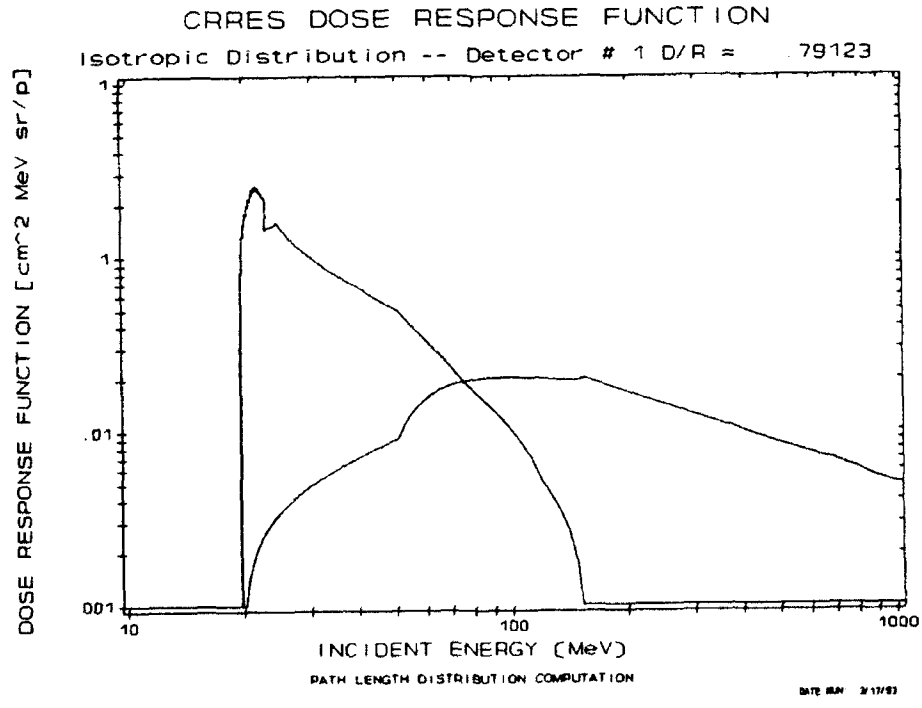

Figure 32.

7. GEOMETRIC FACTOR COMPUTATIONS

This section describes the geometric factor calculations for power law spectra using the infinite slab approximation, the truncated infinite slab path length distribution, and the path length distribution methods. Tables are provided for spectra of the form $f(E) = (E/20)^{-N}$ for values of N between 0.1 to 2.0 at 0.1 intervals and for 2.0 to 10.0 at 1.0 intervals. The dose channel geometric factors are expressed in dose counts, rather than in terms of the actual energy deposited. The dose counts take into account the pre-scaling built into the hardware (digital divide circuitry is used to reduce the frequency of register overflow). Prescaling for the flux channels is used only by CRRES detector 4, and is not taken into account in the flux geometric factor tables.

The geometric factors are obtained by integrating the product of the response function and the spectrum $f(E)$ over the energy; the energy range used to produce the tables extends from threshold to 1000 MeV.

7.1 ISOTROPIC CASE

The "bare detector" response functions were used to compute the geometric factors for power law spectra, with agreement to about 2%, except for DMSP detector 1, where numerical problems were responsible for larger errors for values of the spectral index $N \geq 7$. The response functions values were used as a look up table, and the Janni range-energy relations for aluminum were used to compute the energy losses in the dome. The numerical problems resulted from the difficulty of accurately computing the energy integral contribution in the energy threshold region.

Tables 4 to 7 are tables of the Power Law Geometric Factors for the DMSP instrument for the analytic computation, based upon the bare detector response function, the equivalent Monte Carlo infinite slab approximation computation, the truncated infinite slab approximation computation and the Monte Carlo path length computation respectively.

Tables 8 to 10 are tables of the Power Law Geometric Factors for the CRRES dosimeter for the Monte Carlo infinite slab approximation, the truncated infinite slab path length distribution and the path length distributions respectively. A comparison of the Geometric Factors for these three cases is provided in Section 8.

Table 11 is a table for an isotropic Maxwellian energy spectrum.

7.2 MIRROR PLANE PATH LENGTH DISTRIBUTION

Tables 12 A through S are tables for the Mirror Plane Path Length Distribution for $\lambda = 0$ to 90 degrees at 5 degree intervals. Table 13 is the spin-average (the arithmetic mean of the tables in Table 12. A comparison of Table 13 with Table 10 indicates that the spin average of a Mirror Plane distribution is not isotropic.

7.3 SinN α PITCH ANGLE DISTRIBUTIONS

Tables 14 A through D are tables for the $\sin^N \alpha$ pitch angle distributions for $N = 999$, $\lambda = 0$, 30, 60 and 90 degrees, for comparison with mirror plane Tables 12 A, G, M, and S. Agreement is excellent, except for detector 4 at $\lambda = 0$. A discussion of the differences is provided in Section 5.3.3.

Tables 15, 16, and 17 are tables for $N = 4$, 6 and 8 for $\lambda = 0$, 90 degrees at 15 degree intervals.

TABLE 4. DMSP Omnidirectional Geometric Factors for Power Law Spectra
Infinite Slab Approximation - Analytic Computation (Isotropic)

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

N	HILET CHANNEL				LOLET CHANNEL			
	1	2	3	4	1	2	3	4
.1	1.05270	18.35880	16.55475	14.65495	8.22491	159.87590	157.97310	154.75830
.2	.91399	15.57647	13.78608	11.95127	6.03827	117.17880	115.54070	112.81720
.3	.80008	13.29974	11.54010	9.78654	4.45271	86.24319	84.83129	82.52158
.4	.70573	11.42255	9.70652	8.04460	3.29895	63.75331	62.53497	60.57444
.5	.62692	9.86349	8.20054	6.63618	2.45624	47.34478	46.29231	44.62677
.6	.56056	8.55965	6.95652	5.49229	1.83828	35.32784	34.41779	33.00173
.7	.50426	7.46209	5.92334	4.55933	1.38324	26.49209	25.70442	24.49957
.8	.45615	6.53249	5.06096	3.79539	1.04667	19.96820	19.28586	18.26002
.9	.41475	5.74058	4.33775	3.16755	.79658	15.13024	14.53865	13.66464
1.0	.37890	5.06236	3.72861	2.64980	.60985	11.52617	11.01286	10.26774
1.1	.34766	4.47860	3.21347	2.22148	.46972	8.82863	8.38289	7.74729
1.2	.32029	3.97383	2.77620	1.86610	.36401	6.79975	6.41242	5.86993
1.3	.29619	3.53548	2.40376	1.57045	.28385	5.26614	4.92933	4.46607
1.4	.27485	3.15331	2.08553	1.32387	.22271	4.10097	3.80789	3.41210
1.5	.25587	2.81891	1.81283	1.11774	.17583	3.21112	2.95592	2.61760
1.6	.23893	2.52531	1.57851	.94507	.13967	2.52795	2.30560	2.01628
1.7	.22374	2.26674	1.37668	.80013	.11163	2.00068	1.80684	1.55931
1.8	.21007	2.03836	1.20242	.67825	.08975	1.59158	1.42249	1.21062
1.9	.19772	1.83610	1.05167	.57559	.07259	1.27250	1.12491	.94350
2.0	.18654	1.65654	.92099	.48899	.05904	1.02232	.89343	.73803
2.2	.16711	1.35426	.70879	.35393	.03973	.66903	.57055	.45640
2.4	.15088	1.11296	.54776	.25706	.02732	.44538	.36998	.28601
2.6	.13720	.91893	.42487	.18726	.01918	.30114	.24327	.18141
2.8	.12555	.76190	.33063	.13678	.01374	.20648	.16197	.11635
3.0	.11556	.63410	.25804	.10015	.01005	.14337	.10905	.07536
3.5	.09600	.40648	.14039	.04635	.00504	.06039	.04228	.02641
4.0	.08186	.26513	.07739	.02167	.00291	.02690	.01718	.00966
4.5	.07129	.17543	.04313	.01022	.00196	.01256	.00724	.00365
5.0	.06315	.11749	.02425	.00485	.00151	.00612	.00314	.00141
6.0	.05157	.05427	.00784	.00111	.00120	.00165	.00063	.00022
7.0	.04379	.02586	.00259	.00026	.00113	.00054	.00014	.00004
8.0	.03824	.01262	.00087	.00006	.00112	.00021	.00003	.00001
9.0	.03409	.00627	.00030	.00001	.00113	.00009	.00001	.00000
10.0	.03087	.00317	.00010	.00000	.00115	.00005	.00000	.00000

DMSP PROTON DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm2 MeV)

N	HILET CHANNEL				LOLET CHANNEL			
	1	2	3	4	1	2	3	4
Multiply by:	10^{-3}	10^{-3}	10^{-3}	10^{-3}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
.1	50.27420	51.48453	179.12850	156.72450	444.79490	436.89840	174.06410	164.35820
.2	44.86987	44.54008	151.25140	129.15150	338.56430	331.58170	131.22940	123.53880
.3	40.38478	38.77720	128.36890	106.85820	259.15720	252.97870	99.40755	93.23982
.4	36.62726	33.95515	109.46020	88.74068	199.51190	194.04050	75.66582	70.66368
.5	33.45041	29.88856	93.73647	73.94553	154.48520	149.63570	57.87473	53.77633
.6	30.74088	26.43361	80.58381	61.80889	120.31850	116.01610	44.48272	41.09414
.7	28.41063	23.47798	69.52139	51.81119	94.25528	90.43452	34.35586	31.53183
.8	26.39076	20.93319	60.16962	43.54343	74.26659	70.87004	26.66243	24.29280
.9	24.62694	18.72911	52.22696	36.68171	58.85296	55.83046	20.79028	18.79040
1.0	23.07605	16.80965	45.45200	30.96806	46.90195	44.20950	16.28712	14.59113
1.1	21.70357	15.12966	39.65028	26.19595	37.58467	35.18369	12.81757	11.37353
1.2	20.48172	13.65248	34.66407	22.19912	30.28085	28.13750	10.13189	8.89831
1.3	19.38792	12.34819	30.36462	18.84307	24.52430	22.60881	8.04335	6.98675
1.4	18.40369	11.19211	26.64621	16.01846	19.96289	18.24913	6.41179	5.50483
1.5	17.51386	10.16382	23.42148	13.63606	16.32952	14.79442	5.13154	4.35167
1.6	16.70582	9.24625	20.61789	11.62269	13.42053	12.04378	4.12257	3.45106
1.7	15.96907	8.42509	18.17487	9.91813	11.07990	9.84356	3.32405	2.74520
1.8	15.29476	7.68824	16.04158	8.47263	9.18751	8.07573	2.68950	2.19008
1.9	14.67543	7.02541	14.17519	7.24497	7.65041	6.64920	2.18325	1.75207
2.0	14.10475	6.42784	12.53944	6.20086	6.39633	5.49329	1.77783	1.40536
2.2	13.08838	5.39930	9.84111	4.55367	4.52346	3.78509	1.18917	.91089
2.4	12.21068	4.55375	7.75011	3.35386	3.24663	2.63829	.80387	.59575
2.6	11.44535	3.85422	6.12179	2.47650	2.36354	1.85799	.54856	.39279
2.8	10.77227	3.27232	4.84838	1.83276	1.74487	1.32061	.37749	.26086
3.0	10.17579	2.78596	3.84886	1.35905	1.30643	.94648	.26172	.17436
3.5	8.94467	1.88249	2.17995	.64824	.67668	.42476	.10770	.06524
4.0	7.98598	1.28739	1.24733	.31185	.38988	.19807	.04578	.02511
4.5	7.21763	.88890	.71952	.15104	.25398	.09547	.01996	.00987
5.0	6.58727	.61856	.41782	.07356	.18772	.04746	.00889	.00395
6.0	5.61201	.30511	.14314	.01768	.13832	.01287	.00185	.00066
7.0	4.88960	.15336	.04985	.00431	.12626	.00401	.00041	.00011
8.0	4.33058	.07818	.01758	.00106	.12416	.00146	.00009	.00002
9.0	3.88365	.04029	.00626	.00026	.12489	.00062	.00002	.00000
10.0	3.51729	.02095	.00225	.00007	.12648	.00029	.00001	.00000

TABLE 5. DMSP Omnidirectional Geometric Factors for Power Law Spectra Monte Carlo - Infinite Slab Approximation (Isotropic)

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.03762	18.01397	15.77966	13.44816	8.23975	160.21310	158.74940	155.97240
.2	.90152	15.29297	13.15599	10.98227	6.04979	117.44080	116.15680	113.77680
.3	.78970	13.06550	11.02558	9.00545	4.46177	86.44908	85.32398	83.28426
.4	.69704	11.22811	9.28461	7.41269	3.30616	63.91670	62.93136	61.18347
.5	.61961	9.70143	7.85321	6.12322	2.46205	47.47572	46.61332	45.11542
.6	.55439	8.42401	6.66955	5.07458	1.84302	35.43384	34.67926	33.39539
.7	.49903	7.34817	5.68548	4.21816	1.38714	26.57866	25.91856	24.81803
.8	.45170	6.43646	4.86317	3.51599	1.04992	20.03948	19.46206	18.51855
.9	.41095	5.65941	4.17280	2.93814	.79931	15.18934	14.68431	13.87521
1.0	.37564	4.99353	3.59069	2.46100	.61216	11.57553	11.13375	10.43979
1.1	.34487	4.42009	3.09788	2.06576	.47169	8.87011	8.48361	7.88827
1.2	.31788	3.92396	2.67911	1.73741	.36570	6.83479	6.49661	5.98573
1.3	.29410	3.49288	2.32204	1.46390	.28531	5.29589	4.99992	4.56142
1.4	.27304	3.11685	2.01661	1.23550	.22398	4.12635	3.86724	3.49078
1.5	.25431	2.78764	1.75461	1.04434	.17693	3.23284	3.00595	2.68265
1.6	.23757	2.49845	1.52925	.88400	.14064	2.54661	2.34787	2.07016
1.7	.22255	2.24362	1.33493	.74925	.11247	2.01676	1.84263	1.60401
1.8	.20903	2.01844	1.16700	.63581	.09049	1.60547	1.45285	1.24777
1.9	.19681	1.81890	1.02158	.54015	.07324	1.28453	1.15070	.97441
2.0	.18574	1.64167	.89539	.45936	.05962	1.03277	.91539	.76379
2.2	.16649	1.34312	.69021	.33316	.04018	.67695	.58653	.47435
2.4	.15040	1.10457	.53423	.24245	.02767	.45142	.38166	.29856
2.6	.13682	.91258	.41498	.17696	.01946	.30577	.25185	.19023
2.8	.12525	.75708	.32338	.12949	.01397	.21005	.16829	.12256
3.0	.11532	.63042	.25272	.09498	.01023	.14613	.11373	.07975
3.5	.09585	.40460	.13791	.04414	.00514	.06185	.04450	.02827
4.0	.08177	.26415	.07623	.02072	.00298	.02770	.01826	.01046
4.5	.07123	.17491	.04257	.00981	.00200	.01300	.00776	.00399
5.0	.06311	.11721	.02399	.00467	.00154	.00637	.00340	.00156
6.0	.05154	.05419	.00778	.00108	.00121	.00173	.00069	.00025
7.0	.04376	.02583	.00258	.00025	.00114	.00056	.00015	.00004
8.0	.03821	.01261	.00087	.00006	.00113	.00022	.00004	.00001
9.0	.03406	.00627	.00030	.00001	.00114	.00010	.00001	.00000
10.0	.03084	.00317	.00010	.00000	.00116	.00005	.00000	.00000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
Multiply by:	10^{-3}	10^{-3}	10^{-3}	10^{-3}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
.1	49.82224	51.71883	171.73790	145.90970	443.20230	438.45940	171.43760	159.95860
.2	44.47712	44.71170	145.10760	120.31300	337.39770	332.59340	129.36750	120.40190
.3	40.04076	38.90010	123.23660	99.60563	258.30280	253.61060	98.09285	91.00744
.4	36.32376	34.04008	105.15300	82.76735	198.88780	194.41150	74.74281	69.07925
.5	33.18077	29.94387	90.10616	69.00887	154.03070	149.82990	57.23146	52.65589
.6	30.49971	26.46583	77.51199	57.71599	119.98910	116.09200	44.03926	40.30567
.7	28.19360	23.49223	66.91269	48.40790	94.01839	90.43310	34.05466	30.98068
.8	26.19433	20.93342	57.94693	40.70594	74.09808	70.81988	26.46219	23.91097
.9	24.44828	18.71859	50.32735	34.30997	58.73508	55.75113	20.66134	18.52906
1.0	22.91267	16.79088	43.82387	28.98122	46.82137	44.11436	16.20817	14.41522
1.1	21.55346	15.10462	38.25118	24.52803	37.53157	35.08167	12.77338	11.25788
1.2	20.34316	13.62281	33.45892	20.79626	30.24790	28.03457	10.11155	8.82494
1.3	19.25955	12.31511	29.32428	17.66103	24.50607	22.50876	8.03906	6.94274
1.4	18.28430	11.15667	25.74623	15.02087	19.95526	18.15423	6.41805	5.48099
1.5	17.40245	10.12679	22.64157	12.79289	16.32944	14.70601	5.14442	4.34147
1.6	16.60148	9.20831	19.94077	10.90905	13.42580	11.96242	4.13937	3.44987
1.7	15.87108	8.38676	17.58606	9.31335	11.08877	9.76944	3.34285	2.74976
1.8	15.20247	7.64992	15.52879	7.95950	9.19875	8.00870	2.70901	2.19813
1.9	14.58830	6.98743	13.72796	6.80911	7.66310	6.58890	2.20262	1.76204
2.0	14.02228	6.39043	12.14887	5.83026	6.40976	5.43931	1.79650	1.41618
2.2	13.01398	5.36360	9.54216	4.28499	4.53707	3.74224	1.20557	.92157
2.4	12.14310	4.52021	7.52027	3.15844	3.25936	2.60458	.81763	.60511
2.6	11.38348	3.82307	5.94441	2.33394	2.37495	1.83164	.55977	.40052
2.8	10.71535	3.24364	4.71100	1.72849	1.75481	1.30008	.38647	.26701
3.0	10.12319	2.75971	3.74212	1.28261	1.31491	.93053	.26882	.17915
3.5	8.90074	1.86191	2.12245	.61277	.68205	.41631	.11153	.06766
4.0	7.94863	1.27158	1.21591	.29521	.39305	.19359	.04779	.02627
4.5	7.18544	.87690	.70214	.14317	.25572	.09309	.02100	.01042
5.0	6.55928	.60954	.40811	.06981	.18855	.04617	.00942	.00421
6.0	5.59041	.30010	.14003	.01681	.13826	.01249	.00199	.00071
7.0	4.87264	.15062	.04882	.00410	.12586	.00389	.00045	.00013
8.0	4.31708	.07669	.01723	.00101	.12362	.00142	.00010	.00002
9.0	3.87282	.03949	.00614	.00025	.12431	.00061	.00003	.00000
10.0	3.50852	.02051	.00221	.00006	.12587	.00029	.00001	.00000

TABLE 6. DMSP Omnidirectional Geometric Factors for Power Law Spectra Truncated Infinite Slab Path Length Distribution (Isotropic)

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.89560	17.91869	15.78664	13.46344	8.39569	160.39160	158.81570	156.02360
.2	.79750	15.23049	13.17507	11.00627	6.16612	117.56950	116.19560	113.80470
.3	.71352	13.02560	11.05099	9.03339	4.54893	86.54209	85.34401	83.29688
.4	.64131	11.20364	9.31266	7.44151	3.37175	63.98400	62.93955	61.18643
.5	.57894	9.68737	7.88159	6.15116	2.51163	47.52458	46.61379	45.11259
.6	.52482	8.41695	6.69687	5.10063	1.88068	35.46928	34.67510	33.38919
.7	.47767	7.34570	5.71095	4.24185	1.41588	26.60439	25.91165	24.81011
.8	.43641	6.43696	4.88642	3.53712	1.07196	20.05817	19.45383	18.50993
.9	.40017	5.66173	4.19374	2.95676	.81630	15.20295	14.67558	13.86663
1.0	.36821	4.99694	3.60933	2.47725	.62532	11.58540	11.12506	10.43158
1.1	.33992	4.42407	3.11433	2.07984	.48194	8.87728	8.47529	7.88065
1.2	.31479	3.92816	2.69355	1.74953	.37373	6.83998	6.48884	5.97882
1.3	.29238	3.49709	2.33465	1.47429	.29162	5.29964	4.99281	4.55523
1.4	.27233	3.12092	2.02760	1.24438	.22897	4.12903	3.86081	3.48530
1.5	.25434	2.79150	1.76414	1.05190	.18090	3.23475	3.00019	2.67786
1.6	.23814	2.50205	1.53751	.89043	.14381	2.54795	2.34275	2.06598
1.7	.22352	2.24695	1.34209	.75471	.11502	2.01769	1.83809	1.60039
1.8	.21028	2.02148	1.17319	.64044	.09255	1.60611	1.44885	1.24464
1.9	.19826	1.82168	1.02692	.54408	.07491	1.28495	1.14720	.97172
2.0	.18732	1.64419	.90001	.46268	.06098	1.03303	.91232	.76148
2.2	.16821	1.34517	.69366	.33554	.04109	.67702	.58419	.47266
2.4	.15214	1.10623	.53679	.24415	.02830	.45140	.37989	.29733
2.6	.13852	.91393	.41690	.17817	.01989	.30571	.25051	.18934
2.8	.12687	.75817	.32481	.13036	.01427	.20997	.16728	.12191
3.0	.11685	.63131	.25379	.09560	.01044	.14605	.11297	.07928
3.5	.09715	.40512	.13843	.04441	.00524	.06180	.04413	.02806
4.0	.08285	.26447	.07648	.02084	.00302	.02766	.01807	.01036
4.5	.07213	.17511	.04270	.00986	.00202	.01298	.00767	.00395
5.0	.06386	.11733	.02405	.00469	.00155	.00635	.00335	.00155
6.0	.05207	.05424	.00780	.00108	.00121	.00173	.00068	.00025
7.0	.04416	.02585	.00259	.00025	.00114	.00056	.00015	.00004
8.0	.03851	.01262	.00087	.00006	.00113	.00022	.00003	.00001
9.0	.03428	.00628	.00030	.00001	.00114	.00010	.00001	.00000
10.0	.03101	.00317	.00010	.00000	.00116	.00005	.00000	.00000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
Multiply by:	10^{-3}	10^{-3}	10^{-3}	10^{-3}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
.1	40.84674	50.64671	168.98930	143.18420	447.26490	439.28050	172.20610	160.83750
.2	37.56828	43.95493	143.31520	118.50980	340.95340	333.19950	129.91840	121.03440
.3	34.69897	38.36759	122.10280	98.43714	261.36490	254.05910	98.48689	91.46233
.4	32.17590	33.66704	104.46930	82.03289	201.49330	194.74430	75.02384	69.40612
.5	29.94748	29.68419	89.72697	68.56830	156.22900	150.07720	57.43124	52.89040
.6	27.97051	26.28666	77.33624	57.47255	121.83280	116.27630	44.18050	40.47350
.7	26.20933	23.37012	66.86999	48.29445	95.55829	90.57059	34.15367	31.10041
.8	24.63400	20.85182	57.98894	40.67636	75.38031	70.92248	26.53092	23.99597
.9	23.21930	18.66545	50.42073	34.33276	59.80081	55.82777	20.70831	18.58902
1.0	21.94417	16.75773	43.94625	29.03491	47.70633	44.17167	16.23961	14.45716
1.1	20.79061	15.08542	38.38753	24.59844	38.26619	35.12455	12.79378	11.28691
1.2	19.74355	13.61323	33.59933	20.87395	30.85785	28.06658	10.12412	8.84470
1.3	18.78988	12.31212	29.46233	17.74003	25.01277	22.53263	8.04618	6.95592
1.4	17.91867	11.15807	25.87817	15.09741	20.37670	18.17203	6.42136	5.48949
1.5	17.12035	10.13108	22.76508	12.86483	16.68041	14.71919	5.14518	4.34668
1.6	16.38670	9.21438	20.05485	10.97520	13.71847	11.97214	4.13841	3.45279
1.7	15.71072	8.39386	17.69033	9.37328	11.33326	9.77656	3.34081	2.75112
1.8	15.08617	7.65751	15.62335	8.01320	9.40334	8.01384	2.70633	2.19844
1.9	14.50778	6.99518	13.81323	6.85681	7.83460	6.59257	2.19958	1.76166
2.0	13.97082	6.39811	12.22543	5.87235	6.55386	5.44187	1.79333	1.41538
2.2	13.00546	5.37069	9.60332	4.31729	4.63935	3.74337	1.20251	.92039
2.4	12.16286	4.52651	7.56874	3.18290	3.33254	2.60493	.81492	.60391
2.6	11.42178	3.82851	5.98264	2.35230	2.42771	1.83158	.55749	.39945
2.8	10.76546	3.24827	4.74110	1.74221	1.79312	1.29982	.38460	.26612
3.0	10.18049	2.76365	3.76579	1.29282	1.34293	.93019	.26732	.17843
3.5	8.96421	1.86448	2.13545	.61761	.69521	.41599	.11070	.06727
4.0	8.00990	1.27326	1.22309	.29751	.39944	.19337	.04734	.02608
4.5	7.24145	.87801	.70614	.14426	.25891	.09295	.02077	.01033
5.0	6.60913	.61028	.41035	.07033	.19018	.04609	.00930	.00416
6.0	5.62864	.30043	.14075	.01693	.13870	.01246	.00196	.00070
7.0	4.90152	.15077	.04906	.00413	.12598	.00388	.00044	.00012
8.0	4.33888	.07676	.01731	.00102	.12366	.00142	.00010	.00002
9.0	3.88932	.03952	.00617	.00025	.12432	.00060	.00003	.00000
10.0	3.52107	.02053	.00222	.00006	.12588	.00029	.00001	.00000

TABLE 7. DMSP Proton Omnidirectional Geometric Factors for Power Law Spectra Isotropic Path Length Distribution Calculation

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.01794	18.28648	16.02362	13.60469	10.43353	169.56190	167.48310	164.34670
.2	.90359	15.53719	13.36426	11.11608	7.70249	124.45670	122.68420	119.99640
.3	.80651	13.28491	11.20417	9.11992	5.71598	91.74747	90.22919	87.92428
.4	.72365	11.42574	9.43834	7.51068	4.26546	67.94469	66.63884	64.66117
.5	.65255	9.87983	7.98607	6.20716	3.20193	50.55928	49.43214	47.73444
.6	.59124	8.58543	6.78477	5.14653	2.41870	37.81155	36.83556	35.37741
.7	.53811	7.49450	5.78570	4.27988	1.83921	28.42575	27.57837	26.32533
.8	.49183	6.56936	4.95062	3.56896	1.40833	21.48536	20.74784	19.67060
.9	.45135	5.78030	4.24933	2.98364	1.08627	16.32999	15.68673	14.76019
1.0	.41576	5.10370	3.65782	2.50010	.84423	12.48241	11.92029	11.12303
1.1	.38436	4.52061	3.15689	2.09939	.66126	9.59676	9.10471	8.41838
1.2	.35652	4.01582	2.73110	1.76635	.52213	7.42155	6.99014	6.39909
1.3	.33174	3.57692	2.36793	1.48881	.41566	5.77329	5.39452	4.88529
1.4	.30961	3.19383	2.05718	1.25696	.33367	4.51762	4.18465	3.74573
1.5	.28977	2.85823	1.79053	1.06283	.27010	3.55584	3.26276	2.88429
1.6	.27192	2.56324	1.56110	.89994	.22049	2.81507	2.55681	2.23033
1.7	.25581	2.30314	1.36322	.76300	.18150	2.24136	2.01352	1.73180
1.8	.24122	2.07317	1.19214	.64768	.15065	1.79454	1.59335	1.35014
1.9	.22798	1.86927	1.04395	.55040	.12607	1.44462	1.26678	1.05674
2.0	.21591	1.68806	.91532	.46821	.10634	1.16908	1.01171	.83025
2.2	.19481	1.38255	.70606	.33977	.07745	.77726	.65372	.51812
2.4	.17704	1.13817	.54686	.24739	.05809	.52658	.42923	.32775
2.6	.16193	.94128	.42508	.18065	.04479	.36296	.28598	.20993
2.8	.14899	.78164	.33147	.13226	.03541	.25415	.19307	.13598
3.0	.13780	.65147	.25921	.09705	.02866	.18054	.13189	.08898
3.5	.11569	.41902	.14167	.04515	.01842	.08112	.05316	.03200
4.0	.09950	.27411	.07842	.02122	.01311	.03899	.02255	.01202
4.5	.08726	.18184	.04386	.01005	.01007	.01984	.00996	.00467
5.0	.07774	.12205	.02475	.00479	.00818	.01062	.00454	.00186
6.0	.06401	.05659	.00804	.00111	.00604	.00348	.00102	.00031
7.0	.05467	.02704	.00267	.00026	.00490	.00132	.00025	.00006
8.0	.04793	.01323	.00091	.00006	.00421	.00056	.00007	.00001
9.0	.04285	.00659	.00031	.00001	.00374	.00026	.00002	.00000
10.0	.03889	.00333	.00011	.00000	.00342	.00013	.00001	.00000

OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
Multiply by:	10^{-3}	10^{-3}	10^{-3}	10^{-3}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
.1	46.39975	52.07673	173.08600	146.22080	513.14620	452.47470	176.69070	164.53350
.2	42.51916	45.10906	146.49010	120.79530	392.92560	343.68080	133.46880	123.95110
.3	39.14892	39.31148	124.58630	100.16920	302.79350	262.44770	101.31610	93.77486
.4	36.20663	34.44941	106.43130	83.35474	234.86830	201.50820	77.29272	71.24770
.5	33.62483	30.34111	91.29319	69.58533	183.40230	155.57040	59.26183	54.36320
.6	31.34820	26.84514	78.59927	58.26098	144.18970	120.76910	45.66612	41.65644
.7	29.33112	23.85050	67.89948	48.91069	114.14210	94.27057	35.36617	32.05414
.8	27.53579	21.26930	58.83638	41.16209	90.98153	73.98954	27.52573	24.76782
.9	25.93079	19.03186	51.12520	34.71894	73.02300	58.38616	21.52866	19.21587
1.0	24.48991	17.08206	44.53754	29.34449	59.01355	46.31850	16.91932	14.96797
1.1	23.19120	15.37468	38.88810	24.84864	48.01808	36.93622	13.35942	11.70442
1.2	22.01611	13.87293	34.02657	21.07781	39.33546	29.60353	10.59679	9.18696
1.3	20.94904	12.54659	29.82972	17.90740	32.43724	23.84303	8.44266	7.23728
1.4	19.97666	11.37082	26.19620	15.23583	26.92338	19.29445	6.75515	5.72138
1.5	19.08762	10.32491	23.04207	12.98004	22.48979	15.68481	5.42712	4.53826
1.6	18.27229	9.39161	20.29735	11.07173	18.90387	12.80625	4.37729	3.61142
1.7	17.52232	8.55640	17.90359	9.45460	15.98675	10.49979	3.54378	2.88275
1.8	16.83052	7.80700	15.81172	8.08204	13.60034	8.64316	2.87924	2.30788
1.9	16.19070	7.13293	13.98021	6.91537	11.63738	7.14196	2.34725	1.85282
2.0	15.59744	6.52527	12.37388	5.92236	10.01414	5.92294	1.91973	1.49144
2.2	14.53241	5.47961	9.72151	4.35416	7.53786	4.11533	1.29569	.97361
2.4	13.60424	4.62020	7.66362	3.21037	5.79412	2.89540	.88411	.64135
2.6	12.78884	3.90941	6.05920	2.37295	4.54354	2.06039	.60921	.42592
2.8	12.06730	3.31832	4.80317	1.75782	3.63126	1.48145	.42346	.28492
3.0	11.42451	2.82442	3.81624	1.30468	2.95508	1.07535	.29667	.19184
3.5	10.08863	1.90738	2.16575	.62365	1.89879	.50100	.12552	.07312
4.0	9.04046	1.30374	1.24141	.30061	1.33685	.24465	.05499	.02867
4.5	8.19588	.89977	.71725	.14586	1.01432	.12463	.02478	.01149
5.0	7.50029	.62587	.41711	.07116	.81615	.06605	.01144	.00469
6.0	6.41975	.30851	.14325	.01715	.59752	.02077	.00259	.00082
7.0	5.61618	.15499	.04999	.00419	.48488	.00751	.00063	.00015
8.0	4.99253	.07898	.01766	.00103	.41785	.00306	.00016	.00003
9.0	4.49272	.04070	.00630	.00026	.37399	.00137	.00004	.00001
10.0	4.08210	.02116	.00226	.00006	.34347	.00066	.00001	.00000

TABLE 8. CRRES Proton Omnidirctional Geometric Factors for Power Law Spectra
Monte Carlo Infinite Slab Approximation (Isotropic)

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.165193	.996307	.812916	14.041600	1.317261	8.090243	8.087637	155.348200
.2	.143538	.843136	.677546	11.456340	.967210	5.923604	5.917033	113.277000
.3	.125747	.718063	.567656	9.385640	.713368	4.354785	4.345842	82.882290
.4	.111004	.615164	.477879	7.718676	.528640	3.215084	3.204857	60.859180
.5	.098683	.529893	.404087	6.370321	.393701	2.384222	2.373463	44.852730
.6	.088304	.458741	.343082	5.274764	.294738	1.776277	1.765497	33.182040
.7	.079494	.398983	.292379	4.380827	.221854	1.329718	1.319242	24.644130
.8	.071961	.348486	.250023	3.648516	.167938	1.000365	.990403	18.376460
.9	.065475	.305567	.214473	3.046401	.127867	.756428	.747097	13.758790
1.0	.059854	.268893	.184506	2.549645	.097941	.574952	.566316	10.344170
1.1	.054954	.237397	.159143	2.138499	.075478	.439329	.431403	7.809550
1.2	.050658	.210222	.137597	1.797224	.058528	.337491	.330268	5.920801
1.3	.046871	.186676	.119230	1.513174	.045668	.260652	.254105	4.507750
1.4	.043518	.166190	.103524	1.276161	.035858	.202387	.196478	3.446334
1.5	.040534	.148303	.090053	1.077942	.028332	.157984	.152669	2.645795
1.6	.037867	.132630	.078470	.911814	.022525	.123971	.119204	2.039545
1.7	.035475	.118854	.068485	.772310	.018018	.097784	.093518	1.578542
1.8	.033321	.106710	.059858	.654949	.014500	.077518	.073708	1.226553
1.9	.031375	.095975	.052388	.556053	.011739	.061755	.058357	.956711
2.0	.029610	.086462	.045909	.472587	.009559	.049432	.046404	.749012
2.2	.026543	.070490	.035376	.342342	.006446	.032105	.029709	.464012
2.4	.023979	.057782	.027372	.248842	.004443	.021207	.019315	.291303
2.6	.021814	.047595	.021255	.181420	.003127	.014227	.012735	.185117
2.8	.019970	.039376	.016558	.132617	.002246	.009679	.008502	.118945
3.0	.018387	.032704	.012937	.097170	.001647	.006669	.005741	.077192
3.5	.015283	.020872	.007055	.045048	.000831	.002757	.002242	.027179
4.0	.013037	.013565	.003897	.021101	.000482	.001209	.000918	.009985
4.5	.011356	.008949	.002176	.009966	.000325	.000557	.000389	.003789
5.0	.010061	.005979	.001225	.004739	.000251	.000269	.000170	.001475
6.0	.008216	.002752	.000397	.001090	.000198	.000073	.000035	.000236
7.0	.006977	.001309	.000132	.000255	.000186	.000024	.000008	.000040
8.0	.006092	.000638	.000044	.000060	.000185	.000010	.000002	.000007
9.0	.005430	.000317	.000015	.000014	.000187	.000005	.000000	.000001
10.0	.004917	.000160	.000005	.000004	.000189	.000002	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	2.619097	3.849224	6.124951	6.687885	.763012	4.589471	4.671194	44.110260
.2	2.322209	3.304017	5.155959	5.495407	.577239	3.455491	3.515494	32.915520
.3	2.076534	2.854421	4.362784	4.533999	.439169	2.614799	2.658442	24.664170
.4	1.871340	2.480670	3.709190	3.754884	.336061	1.988806	2.020162	18.559340
.5	1.698421	2.167570	3.167234	3.120434	.258681	1.520565	1.542705	14.025120
.6	1.551444	1.903362	2.715190	2.601443	.200309	1.168676	1.183934	10.644060
.7	1.425493	1.678877	2.336065	2.175100	.156043	.902957	.913103	8.112676
.8	1.316715	1.486918	2.016469	1.823485	.122292	.701326	.707695	6.209653
.9	1.222088	1.321788	1.745787	1.532445	.096416	.547561	.551167	4.773087
1.0	1.139203	1.178952	1.515532	1.290730	.076466	.429711	.431317	3.684119
1.1	1.066139	1.054771	1.318881	1.089364	.060997	.338930	.339109	2.855193
1.2	1.001352	.946297	1.150318	.921130	.048936	.268646	.267832	2.221589
1.3	.943583	.851131	1.005348	.780211	.039478	.213959	.212472	1.735284
1.4	.891809	.767313	.880282	.661884	.032020	.171196	.169274	1.360520
1.5	.845188	.693217	.772088	.562314	.026107	.137592	.135414	1.070556
1.6	.803021	.627495	.678250	.478352	.021393	.111060	.108753	.845328
1.7	.764725	.569024	.596670	.407425	.017615	.090014	.087670	.669713
1.8	.729813	.516853	.525596	.347403	.014572	.073242	.070927	.532277
1.9	.697874	.470183	.463552	.296532	.012109	.059818	.057577	.424335
2.0	.668556	.428335	.409293	.253353	.010106	.049029	.046890	.339262
2.2	.616636	.356854	.320062	.185425	.007127	.033266	.031380	.218632
2.4	.572135	.298671	.251192	.136130	.005106	.022847	.021230	.142294
2.6	.533608	.250986	.197767	.100211	.003713	.015863	.014503	.093433
2.8	.499962	.211666	.156139	.073944	.002740	.011122	.009994	.061836
3.0	.470348	.179074	.123579	.054677	.002052	.007868	.006939	.041214
3.5	.409882	.119302	.069507	.025908	.001065	.003425	.002868	.015341
4.0	.363479	.080602	.039520	.012388	.000616	.001555	.001225	.005885
4.5	.326768	.055070	.022666	.005967	.000404	.000732	.000537	.002310
5.0	.296992	.037973	.013093	.002891	.000300	.000357	.000240	.000924
6.0	.251562	.018451	.004444	.000688	.000222	.000095	.000051	.000154
7.0	.218426	.009167	.001535	.000166	.000203	.000030	.000011	.000027
8.0	.193085	.004630	.000538	.000041	.000199	.000012	.000003	.000005
9.0	.173007	.002369	.000190	.000010	.000201	.000005	.000001	.000001
10.0	.156664	.001224	.000068	.000002	.000203	.000003	.000000	.000000

TABLE 9. CRRES Proton Omnidirectional Geometric Factors for Power Law Spectra Truncated Infinite Slab Path Length Distribution (Isotropic)

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.109742	.831575	.672142	13.784540	1.376148	8.269094	8.238956	155.684600
.2	.100551	.722053	.574011	11.263470	1.013340	6.056869	6.029483	113.532000
.3	.092337	.628951	.491361	9.240042	.749670	4.454466	4.429697	83.076700
.4	.084983	.549520	.421555	7.608146	.557337	3.289946	3.267625	61.008210
.5	.078388	.481516	.362438	6.285917	.416488	2.440676	2.420628	44.967750
.6	.072462	.423097	.312243	5.209906	.312910	1.819032	1.801070	33.271270
.7	.067127	.372747	.269518	4.330709	.236407	1.362238	1.346184	24.713760
.8	.062317	.329213	.233063	3.609557	.179640	1.025210	1.010888	18.431040
.9	.057972	.291456	.201888	3.015945	.137314	.775494	.762739	13.801840
1.0	.054040	.258615	.175170	2.525704	.105596	.589652	.578306	10.378280
1.1	.050475	.229967	.152223	2.119588	.081704	.450712	.440634	7.836704
1.2	.047238	.204911	.132477	1.782208	.063610	.346347	.337403	5.942514
1.3	.044293	.182938	.115452	1.501193	.049831	.267573	.259643	4.525198
1.4	.041609	.163622	.100748	1.266563	.039279	.207821	.200794	3.460403
1.5	.039159	.146601	.088027	1.070219	.031151	.162269	.156046	2.657185
1.6	.036919	.131568	.077002	.905577	.024856	.127365	.121857	2.048795
1.7	.034868	.118263	.067434	.767254	.019951	.100484	.095611	1.586081
1.8	.032986	.106463	.059118	.650838	.016108	.079675	.075365	1.232715
1.9	.031256	.095977	.051879	.552700	.013079	.063485	.059673	.961762
2.0	.029665	.086641	.045571	.469846	.010679	.050825	.047454	.753162
2.2	.026843	.070874	.035256	.340496	.007235	.033019	.030384	.466834
2.4	.024430	.058251	.027366	.247588	.005003	.021815	.019755	.293238
2.6	.022356	.048082	.021306	.180563	.003528	.014637	.013024	.186452
2.8	.020561	.039844	.016633	.132027	.002536	.009958	.008695	.119872
3.0	.019000	.033137	.013017	.096763	.001857	.006862	.005870	.077838
3.5	.015889	.021197	.007122	.044885	.000928	.002837	.002291	.027446
4.0	.013595	.013795	.003942	.021034	.000529	.001243	.000938	.010098
4.5	.011857	.009108	.002204	.009939	.000348	.000573	.000398	.003837
5.0	.010507	.006088	.001243	.004728	.000263	.000276	.000174	.001495
6.0	.008565	.002803	.000403	.001088	.000201	.000075	.000035	.000240
7.0	.007251	.001332	.000134	.000255	.000187	.000025	.000008	.000041
8.0	.006309	.000689	.000045	.000060	.000185	.000010	.000002	.000007
9.0	.005603	.000322	.000015	.000014	.000187	.000005	.000000	.000001
10.0	.005055	.000162	.000005	.000004	.000189	.000002	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				multiply by 10^{-3} LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.635479	3.051274	4.771634	6.464156	.734853	4.642711	4.718792	44.036560
.2	1.529175	2.696106	4.127878	5.329594	.561127	3.500360	3.555384	32.866500
.3	1.433031	2.389255	3.578414	4.410467	.430960	2.652267	2.691577	24.632250
.4	1.345897	2.123188	3.108190	3.662351	.332934	2.019888	2.047493	18.539220
.5	1.266768	1.891687	2.704772	3.050720	.258726	1.546220	1.565145	14.012990
.6	1.194764	1.689586	2.357836	2.548610	.202248	1.189780	1.202291	10.637310
.7	1.129115	1.512585	2.058792	2.134814	.159029	.920274	.928078	8.109527
.8	1.069135	1.357094	1.800475	1.792577	.125773	.715513	.719892	6.208829
.9	1.014231	1.220095	1.576873	1.508580	.100041	.559175	.561088	4.773716
1.0	.963875	1.099054	1.382943	1.272189	.080019	.439214	.439383	3.685615
1.1	.917600	.991830	1.214441	1.074866	.064354	.346708	.345666	2.857161
1.2	.874995	.896607	1.067776	.909723	.052029	.275016	.273163	2.223773
1.3	.835697	.811838	.939906	.771181	.042279	.219180	.216809	1.737510
1.4	.799381	.736203	.828249	.654695	.034526	.175479	.172806	1.362684
1.5	.765762	.668573	.730606	.556555	.028328	.141112	.138292	1.072592
1.6	.734583	.607980	.645098	.473716	.023349	.113956	.111102	.847202
1.7	.705617	.553584	.570119	.403672	.019328	.092400	089588	.671412
1.8	.678661	.504665	.504291	.344351	.016067	.075212	.072496	.533799
1.9	.653534	.460593	.446430	.294038	.013410	.061447	.058862	.425686
2.0	.630073	.420823	.395513	.251307	.011235	.050378	.047945	.340454
2.2	.587583	.352348	.311112	.184033	.007974	.034197	.032093	.219543
2.4	.550198	.296100	.245371	.135169	.005739	.023494	.021716	.142980
2.6	.517110	.249658	.193985	.099540	.004186	.016316	.014836	.093944
2.8	.487663	.211133	.153694	.073472	.003094	.011441	.010223	.062215
3.0	.461317	.179040	.122013	.054342	.002317	.008094	.007098	.041493
3.5	.406294	.119800	.069035	.025762	.001196	.003524	.002933	.015469
4.0	.362952	.081174	.039421	.012323	.000682	.001599	.001252	.005943
4.5	.327980	.055570	.022682	.005937	.000437	.000753	.000549	.002337
5.0	.299174	.038368	.013134	.002877	.000317	.000367	.000245	.000936
6.0	.254484	.018670	.004473	.000685	.000227	.000098	.000052	.000157
7.0	.221348	.009280	.001549	.000166	.000204	.000031	.000012	.000027
8.0	.195731	.004687	.000543	.000040	.000200	.000012	.000003	.000005
9.0	.175294	.002397	.000192	.000010	.000201	.000005	.000001	.000001
10.0	.158588	.001238	.000069	.000002	.000203	.000003	.000000	.000000

TABLE 10. CRRES Proton Omnidirectional Geometric Factors for Power Law Spectra
Isotropic Path Length Distribution Calculation

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.140964	.955409	.766305	14.215000	2.224473	10.494150	10.180770	163.678700
.2	.129520	.826480	.651606	11.604460	1.653132	7.723066	7.479519	119.477500
.3	.119303	.717634	.555647	9.512209	1.235790	5.710072	5.518507	87.518200
.4	.110165	.625353	.475099	7.826946	.929648	4.242469	4.089[illegible]7	64.341450
.5	.101973	.546792	.407266	6.462989	.704054	3.168352	3.045373	47.480910
.6	.094616	.479644	.349963	5.354127	.537013	2.379005	2.278666	35.175220
.7	.087994	.422027	.301412	4.448836	.412692	1.796419	1.713602	26.163170
.8	.082022	.372403	.260156	3.706849	.319660	1.364474	1.295375	19.539880
.9	.076626	.329509	.225004	3.096467	.249642	1.042685	.984447	14.654290
1.0	.071741	.292306	.194975	2.592637	.196625	.801756	.752219	11.036840
1.1	.067308	.259930	.169258	2.175452	.156228	.620429	.577941	8.347971
1.2	.063279	.231669	.147182	1.828998	.125242	.483218	.446507	6.341347
1.3	.059609	.206924	.128190	1.540511	.101313	.378812	.346882	4.837800
1.4	.056260	.185196	.111817	1.299697	.082704	.298909	.270978	3.706553
1.5	.053199	.166066	.097672	1.098214	.068127	.237400	.212844	2.851891
1.6	.050394	.149179	.085431	.929284	.056624	.189769	.168084	2.203480
1.7	.047821	.134237	.074817	.787372	.047481	.152662	.133439	1.709487
1.8	.045454	.120985	.065599	.667942	.040158	.123579	.106481	1.331570
1.9	.043275	.109206	.057581	.567264	.034250	.100647	.085395	1.041256
2.0	.041265	.098715	.050596	.482266	.029448	.082455	.068814	.817326
2.2	.037686	.080982	.039180	.349565	.022273	.056287	.045303	.509071
2.4	.034610	.066758	.030447	.254238	.017328	.039244	.030335	.321395
2.6	.031947	.055275	.023736	.185458	.013827	.027897	.020628	.205438
2.8	.029630	.045950	.018558	.135640	.011286	.020183	.014223	.132802
3.0	.027600	.038337	.014547	.099437	.009397	.014837	.009929	.086723
3.5	.023507	.024715	.007993	.046156	.006392	.007302	.004234	.031038
4.0	.020436	.016205	.004445	.021645	.004712	.003858	.001904	.011605
4.5	.018069	.010774	.002496	.010234	.003685	.002156	.000893	.004487
5.0	.016198	.007248	.001414	.004872	.003010	.001261	.000433	.001782
6.0	.013451	.003375	.000463	.001122	.002201	.000478	.000110	.000298
7.0	.011544	.001619	.000155	.000263	.001744	.000200	.000030	.000053
8.0	.010149	.000795	.000053	.000062	.001457	.000089	.000009	.000010
9.0	.009087	.000397	.000018	.000015	.001263	.000042	.000003	.000002
10.0	.008253	.000202	.000006	.000004	.001125	.000020	.000001	.000000

DOSE GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				multiply by 10^{-3} LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	2.084789	3.514122	5.465237	6.721985	1.047623	5.443544	5.436980	45.637140
.2	1.952233	3.093674	4.709353	5.532081	.806789	4.119221	4.106980	34.084960
.3	1.832482	2.732758	4.068085	4.570593	.625740	3.134467	3.118250	25.564500
.4	1.724063	2.421653	3.522346	3.789852	.488868	2.398771	2.379919	19.256050
.5	1.625687	2.152405	3.056516	3.152925	.384794	1.846454	1.826016	14.567040
.6	1.536223	1.918481	2.657758	2.631054	.305179	1.429714	1.408487	11.067720
.7	1.454693	1.714494	2.315492	2.201719	.243897	1.113631	1.092215	8.445512
.8	1.380227	1.535983	2.020960	1.847179	.196428	.872615	.851453	6.472406
.9	1.312071	1.379238	1.766889	1.553380	.159420	.687838	.667246	4.981483
1.0	1.249560	1.241167	1.547215	1.309131	.130378	.545392	.525592	3.850144
1.1	1.192105	1.119179	1.356875	1.105466	.107437	.434969	.416105	2.988032
1.2	1.139191	1.011089	1.191610	.935176	.089196	.348888	.331049	2.328320
1.3	1.090359	.915056	1.047845	.792434	.074595	.281410	.264639	1.821378
1.4	1.045210	.829515	.922554	.672505	.062832	.228219	.212529	1.430222
1.5	1.003384	.753140	.813179	.571527	.053294	.186059	.171438	1.127188
1.6	.964558	.684792	.717546	.486340	.045511	.152461	.138882	.891493
1.7	.928460	.623497	.633801	.414343	.039120	.125545	.112966	.707465
1.8	.894828	.568416	.560365	.353394	.033840	.103870	.092244	.563239
1.9	.863447	.518826	.495882	.301717	.029452	.086327	.075601	.449798
2.0	.834112	.474101	.439191	.257841	.025785	.072058	.062179	.360259
2.2	.780884	.397132	.345320	.188787	.020098	.050827	.042475	.233009
2.4	.733923	.333929	.272287	.138650	.015997	.036401	.029363	.152222
2.6	.692242	.281746	.215248	.102100	.012981	.026434	.020517	.100341
2.8	.655036	.238448	.170549	.075362	.010721	.019443	.014474	.066674
3.0	.621649	.202364	.135413	.055742	.009000	.014470	.010300	.044621
3.5	.551561	.135692	.076668	.026431	.006179	.007239	.004545	.016790
4.0	.495949	.092138	.043820	.012647	.004562	.003833	.002084	.006516
4.5	.450772	.063208	.025240	.006095	.003564	.002130	.000986	.002590
5.0	.413337	.043730	.014632	.002955	.002908	.001234	.000479	.001050
6.0	.354830	.021359	.004995	.000704	.002124	.000458	.000121	.000181
7.0	.311097	.010653	.001733	.000170	.001686	.000188	.000033	.000033
8.0	.277081	.005397	.000609	.000042	.001413	.000083	.000009	.000006
9.0	.249812	.002768	.000216	.000010	.001229	.000039	.000003	.000001
10.0	.227433	.001434	.000077	.000003	.001099	.000019	.000001	.000000

TABLE 11. CRRES Omnidirectional Geometric Factors for Maxwellian Energy Distribution Isotropic Path Length Distribution Computation

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^3 MeV)

		HILET CHANNEL			MULTIPLY BY 10^{-3}	LOLET CHANNEL		
kT (MeV)	1	2	3	4	1	2	3	4
5.0	20.071	7.011	.372	.086	3.561	.758	.045	.004
6.0	24.357	14.221	1.284	.640	4.816	1.688	.175	.039
7.0	28.762	24.223	3.183	2.744	6.319	3.168	.490	.208
8.0	33.258	36.847	6.394	8.308	8.093	5.321	1.111	.779
9.0	37.818	51.838	11.138	19.885	10.163	8.274	2.179	2.269
10.0	42.418	68.912	17.531	40.315	12.549	12.156	3.843	5.496
11.0	47.038	87.791	25.599	72.363	15.269	17.089	6.253	11.584
12.0	51.661	108.215	35.305	118.462	18.340	23.187	9.555	21.932
13.0	56.273	129.949	46.569	180.566	21.773	30.556	13.887	38.151
14.0	60.862	152.786	59.286	260.103	25.579	39.290	19.374	61.999
15.0	65.418	176.541	73.337	357.999	29.766	49.472	26.129	95.314
16.0	69.933	201.059	88.598	474.723	34.342	61.176	34.255	139.959
17.0	74.401	226.200	104.946	610.363	39.313	74.464	43.838	197.769
18.0	78.817	251.849	122.263	764.700	44.681	89.391	54.959	270.521
19.0	83.176	277.903	140.439	937.271	50.452	106.003	67.682	359.908
20.0	87.476	304.277	159.370	1127.435	56.628	124.341	82.067	467.519
21.0	91.713	330.894	178.963	1334.426	63.211	144.436	98.162	594.835
22.0	95.885	357.691	199.130	1557.389	70.203	166.319	116.009	743.220
23.0	99.991	384.614	219.795	1795.421	77.604	190.011	135.643	913.922
24.0	104.031	411.616	240.888	2047.591	85.416	215.533	157.095	1108.075
25.0	108.002	438.656	262.344	2312.964	93.639	242.901	180.387	1326.710

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^3 MeV)

		HILET CHANNEL			multiply by 10^{-4}	LOLET CHANNEL		
kT (MeV)	1	2	3	4	1	2	3	4
5.0	509.022	47.283	4.638	.067	3.410	.698	.045	.002
6.0	592.422	91.845	15.304	.476	4.617	1.564	.179	.022
7.0	672.634	150.467	36.525	1.966	6.077	2.968	.512	.123
8.0	750.107	221.035	71.008	5.761	7.820	5.056	1.186	.475
9.0	825.138	301.381	120.208	13.410	9.873	7.986	2.369	1.406
10.0	897.924	389.548	184.495	26.543	12.261	11.914	4.242	3.438
11.0	968.608	483.860	263.461	46.657	14.999	16.987	6.987	7.283
12.0	1037.305	582.920	356.201	74.989	18.101	23.339	10.778	13.812
13.0	1104.105	685.585	461.535	112.454	21.576	31.087	15.776	24.013
14.0	1169.088	790.914	578.163	159.648	25.430	40.328	22.120	38.941
15.0	1232.323	898.152	704.768	216.876	29.664	51.143	29.933	59.669
16.0	1293.873	1006.687	840.078	284.200	34.279	63.595	39.317	87.257
17.0	1353.798	1116.012	982.902	361.486	39.274	77.733	50.353	122.717
18.0	1412.153	1225.732	1132.152	448.451	44.646	93.593	63.109	166.995
19.0	1468.990	1335.520	1286.834	544.702	50.391	111.200	77.636	220.959
20.0	1524.360	1445.109	1446.071	649.772	56.505	130.567	93.970	285.389
21.0	1578.307	1554.297	1609.071	763.151	62.984	151.703	112.139	360.979
22.0	1630.881	1662.903	1775.147	884.299	69.820	174.607	132.157	448.332
23.0	1682.119	1770.800	1943.682	1012.666	77.009	199.274	154.031	547.969
24.0	1732.068	1877.873	2114.144	1147.711	84.545	225.693	177.763	660.331
25.0	1780.765	1984.044	2286.065	1288.904	92.420	253.852	203.346	785.785

TABLE 12 A. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plate Path Length Distribution, λ = 0 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.170932	1.407956	1.261448	13.452650	1.311834	2.500968	2.259882	.501950
.2	.152418	1.130886	1.003702	9.766838	.959418	1.775038	1.602212	.353090
.3	.136294	.912044	.801214	7.110640	.704334	1.261828	1.137638	.248752
.4	.122230	.738634	.641694	5.191758	.519134	.898528	.809052	.175530
.5	.109938	.600764	.515662	3.801986	.384232	.640990	.576340	.124076
.6	.099174	.490770	.415796	2.792778	.285636	.458154	.411296	.087868
.7	.089728	.402696	.336422	2.057922	.213316	.328152	.294072	.062350
.8	.081426	.331914	.273140	1.521324	.160072	.235564	.210682	.044338
.9	.074112	.274808	.222528	1.128362	.120720	.169506	.151264	.031602
1.0	.067654	.228558	.181920	.839728	.091516	.122290	.108852	.022580
1.1	.061944	.190948	.149232	.627070	.069754	.088472	.078524	.016178
1.2	.056880	.160240	.122834	.469900	.053466	.064202	.056794	.011624
1.3	.052380	.135064	.101444	.353370	.041220	.046744	.041192	.008376
1.4	.048374	.114338	.084054	.266686	.031972	.034154	.029966	.006058
1.5	.044798	.097202	.069870	.201992	.024952	.025054	.021868	.004396
1.6	.041600	.082978	.058262	.153548	.019600	.018456	.016014	.003202
1.7	.038734	.071118	.048732	.117146	.015498	.013658	.011768	.002342
1.8	.036158	.061190	.040882	.089700	.012338	.010158	.008682	.001720
1.9	.033838	.052846	.034396	.068936	.009892	.007596	.006432	.001270
2.0	.031746	.045804	.029020	.053170	.007990	.005714	.004786	.000942
2.2	.028134	.034762	.020820	.031978	.005328	.003296	.002688	.000526
2.4	.025152	.026716	.015086	.019510	.003666	.001956	.001540	.000300
2.6	.022670	.020770	.011030	.012072	.002602	.001200	.000904	.000176
2.8	.020584	.016312	.008132	.007574	.001910	.000762	.000542	.000106
3.0	.018816	.012932	.006040	.004816	.001448	.000502	.000334	.000066
3.5	.015424	.007492	.002954	.001642	.000828	.000206	.000110	.000022
4.0	.013036	.004520	.001494	.000602	.000558	.000102	.000042	.000008
4.5	.011284	.002814	.000774	.000236	.000426	.000058	.000018	.000004
5.0	.009956	.001798	.000410	.000098	.000354	.000036	.000008	.000002
6.0	.008090	.000778	.000120	.000018	.000282	.000016	.000002	.000000
7.0	.006852	.000358	.000038	.000004	.000250	.000008	.000000	.000000
8.0	.005974	.000172	.000012	.000000	.000234	.000004	.000000	.000000
9.0	.005322	.000086	.000004	.000000	.000224	.000002	.000000	.000000
10.0	.004820	.000044	.000002	.000000	.000220	.000002	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.968214	4.203022	7.260414	9.442640	.859254	2.630664	2.571680	.292870
.2	1.818304	3.524886	5.998056	7.010392	.644770	1.875876	1.831522	.205994
.3	1.684654	2.969378	4.972360	5.220614	.485938	1.339802	1.306344	.145106
.4	1.565220	2.512392	4.136046	3.899804	.367868	.958554	.933232	.102378
.5	1.458232	2.134856	3.451794	2.922222	.279756	.687032	.667796	.072358
.6	1.362170	1.821624	2.890014	2.196538	.213738	.493370	.478700	.051234
.7	1.275708	1.560636	2.427216	1.656230	.164070	.355026	.343790	.036348
.8	1.197702	1.342258	2.044670	1.252734	.126550	.256036	.247388	.025844
.9	1.127152	1.158768	1.727414	.950498	.098086	.185082	.178392	.018416
1.0	1.063194	1.003962	1.463452	.723422	.076400	.134132	.128926	.013156
1.1	1.005070	.872824	1.243132	.552300	.059808	.097472	.093398	.009422
1.2	.952126	.761300	1.058676	.422950	.047056	.071040	.067832	.006768
1.3	.903784	.666094	.903782	.324882	.037216	.051942	.049396	.004876
1.4	.859540	.584516	.773338	.250306	.029586	.038108	.036074	.003524
1.5	.818958	.514364	.663178	.193426	.023646	.028064	.026426	.002556
1.6	.781648	.453832	.569896	.149914	.019002	.020752	.019422	.001862
1.7	.747270	.401424	.490706	.116532	.015354	.015412	.014324	.001360
1.8	.715522	.355910	.423312	.090844	.012478	.011500	.010602	.000998
1.9	.686146	.316262	.365824	.071024	.010198	.008626	.007878	.000736
2.0	.658902	.281622	.316674	.055684	.008384	.006506	.005880	.000546
2.2	.610020	.224622	.238410	.034516	.005770	.003770	.003318	.000304
2.4	.567488	.180438	.180512	.021630	.004074	.002246	.001910	.000174
2.6	.530212	.145872	.137372	.013702	.002952	.001378	.001122	.000102
2.8	.497314	.118604	.105020	.008770	.002198	.000874	.000674	.000060
3.0	.468092	.096934	.080618	.005672	.001682	.000574	.000416	.000038
3.5	.407674	.059692	.042268	.001994	.000970	.000234	.000138	.000012
4.0	.360614	.037636	.022568	.000744	.000650	.000114	.000052	.000004
4.5	.322960	.024194	.012228	.000292	.000490	.000064	.000022	.000002
5.0	.292156	.015810	.006704	.000122	.000402	.000038	.000010	.000000
6.0	.244790	.007032	.002076	.000024	.000316	.000016	.000002	.000000
7.0	.210086	.003266	.000662	.000006	.000276	.000008	.000000	.000000
8.0	.183588	.001570	.000216	.000002	.000256	.000004	.000000	.000000
9.0	.162714	.000776	.000072	.000000	.000246	.000002	.000000	.000000
10.0	.145864	.000392	.000024	.000000	.000240	.000002	.000000	.000000

TABLE 12 B. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 5 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.167042	1.345864	1.196052	22.183920	1.431004	3.442412	3.192962	10.507180
.2	.149428	1.091880	.960672	16.465680	1.050352	2.473424	2.291974	7.509926
.3	.134058	.889636	.774216	12.272350	.774284	1.782238	1.649564	5.381400
.4	.120622	.728032	.626078	9.186136	.573396	1.288152	1.190562	3.866684
.5	.108850	.598436	.508022	6.906218	.426698	.934140	.861878	2.786386
.6	.098520	.494124	.413648	5.215404	.319170	.679864	.625956	2.014102
.7	.089434	.409842	.337966	3.956434	.240046	.496738	.456188	1.460632
.8	.081428	.341478	.277082	3.015144	.181578	.364476	.333694	1.062922
.9	.074360	.285804	.227938	2.308398	.138186	.268656	.245056	.776334
1.0	.068102	.240280	.188144	1.775468	.105838	.199006	.180720	.569196
1.1	.062554	.202900	.155814	1.371850	.081604	.148200	.133870	.419012
1.2	.057624	.172084	.129462	1.064814	.063362	.110996	.099634	.309756
1.3	.053232	.146568	.107910	.830208	.049556	.083642	.074524	.229994
1.4	.049312	.125356	.090226	.650144	.039054	.063438	.056034	.171548
1.5	.045804	.107646	.075670	.511330	.031020	.048448	.042362	.128554
1.6	.042658	.092800	.063648	.403842	.024838	.037268	.032210	.096800
1.7	.039832	.080302	.053690	.320248	.020052	.028884	.024634	.073248
1.8	.037286	.069738	.045414	.254958	.016328	.022564	.018954	.055704
1.9	.034986	.060774	.038516	.203748	.013408	.017768	.014674	.042574
2.0	.032906	.053138	.032748	.163416	.011108	.014106	.011432	.032706
2.2	.029304	.041006	.023846	.106212	.007824	.009114	.007070	.019594
2.4	.026316	.032008	.017520	.069914	.005704	.006084	.004484	.011972
2.6	.023816	.025242	.012978	.046554	.004298	.004190	.002914	.007456
2.8	.021706	.020092	.009684	.031322	.003344	.002968	.001936	.004726
3.0	.019910	.016126	.007276	.021272	.002676	.002160	.001314	.003046
3.5	.016442	.009600	.003650	.008372	.001708	.001068	.000540	.001080
4.0	.013974	.005922	.001886	.003430	.001226	.000584	.000242	.000412
4.5	.012152	.003756	.000996	.001452	.000956	.000340	.000116	.000166
5.0	.010758	.002436	.000538	.000630	.000788	.000208	.000058	.000070
6.0	.008786	.001078	.000162	.000126	.000598	.000084	.000016	.000014
7.0	.007466	.000502	.000052	.000026	.000496	.000038	.000004	.000002
8.0	.006524	.000242	.000016	.000006	.000434	.000018	.000002	.000000
9.0	.005822	.000120	.000006	.000002	.000394	.000008	.000000	.000000
10.0	.005278	.000062	.000002	.000000	.000368	.000004	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.913036	3.973142	6.792010	10.379930	.883420	3.035984	3.011202	4.900592
.2	1.771042	3.356838	5.648630	7.945110	.665600	2.192348	2.172130	3.502854
.3	1.644248	2.848680	4.713566	6.108850	.503950	1.587602	1.570954	2.510188
.4	1.530754	2.427892	3.946210	4.718012	.383496	1.153160	1.139326	1.803740
.5	1.428930	2.077966	3.314320	3.659992	.293360	.840340	.828740	1.299874
.6	1.337356	1.785720	2.792210	2.851624	.225618	.614542	.604728	.939650
.7	1.254800	1.540606	2.359362	2.231302	.174476	.451126	.442756	.681478
.8	1.180200	1.334160	1.999332	1.753218	.135692	.332526	.325330	.495950
.9	1.112624	1.159562	1.698910	1.383168	.106144	.246190	.239960	.362252
1.0	1.051266	1.011298	1.447432	1.095522	.083522	.183140	.177708	.265614
1.1	.995420	.884898	1.236286	.870998	.066120	.136934	.132170	.195544
1.2	.944470	.776720	1.058476	.695026	.052670	.102948	.098746	.144566
1.3	.897882	.683792	.908308	.556558	.042222	.077850	.074126	.107346
1.4	.855182	.603674	.781138	.447180	.034064	.059238	.055922	.080072
1.5	.815956	.534362	.673158	.360456	.027662	.045372	.042408	.060008
1.6	.779844	.474194	.581236	.291442	.022616	.034992	.032336	.045188
1.7	.746522	.421800	.502794	.236334	.018614	.027180	.024792	.034196
1.8	.715710	.376034	.435702	.192180	.015426	.021272	.019118	.026008
1.9	.687160	.335940	.378188	.156690	.012874	.016776	.014830	.019880
2.0	.660652	.300720	.328780	.128076	.010820	.013334	.011572	.015272
2.2	.612998	.242302	.249572	.086174	.007804	.008626	.007174	.009150
2.4	.571438	.196544	.190454	.058484	.005790	.005760	.004556	.005592
2.6	.534930	.160380	.146032	.040002	.004416	.003964	.002962	.003482
2.8	.502642	.131576	.112448	.027552	.003460	.002806	.001968	.002208
3.0	.473912	.108466	.086920	.019098	.002780	.002038	.001334	.001424
3.5	.414318	.068152	.046324	.007828	.001774	.001006	.000546	.000506
4.0	.367716	.043762	.025112	.003302	.001268	.000548	.000244	.000192
4.5	.330296	.028602	.013800	.001426	.000984	.000318	.000116	.000078
5.0	.299588	.018970	.007670	.000628	.000810	.000194	.000058	.000032
6.0	.252178	.008648	.002434	.000128	.000612	.000080	.000016	.000006
7.0	.217274	.004092	.000794	.000028	.000508	.000036	.000004	.000002
8.0	.190508	.001994	.000264	.000006	.000446	.000016	.000002	.000000
9.0	.169342	.000994	.000090	.000002	.000406	.000008	.000000	.000000
10.0	.152196	.000504	.000030	.000000	.000378	.000004	.000000	.000000

TABLE 12 C. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 10 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	NILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.163312	1.291006	1.128434	23.230800	1.542602	4.371354	4.101120	27.790340
.2	.146528	1.058490	.915776	17.762160	1.135630	3.162174	2.963356	19.760250
.3	.131854	.871590	.745648	13.633910	.839982	2.295196	2.147866	14.080020
.4	.118998	.720816	.609128	10.506210	.624446	1.671984	1.561932	10.055250
.5	.107714	.598738	.499248	8.127846	.466718	1.222774	1.139834	7.198312
.6	.097790	.499522	.410534	6.312568	.350832	.898038	.834918	5.166448
.7	.089042	.418574	.338684	4.921868	.265332	.662542	.614000	3.718406
.8	.081318	.352272	.280312	3.852398	.201962	.491190	.453438	2.684160
.9	.074482	.297750	.232738	3.026860	.154778	.366062	.336354	1.943722
1.0	.068418	.252736	.193842	2.387196	.119468	.274334	.250674	1.412292
1.1	.063028	.215420	.161940	1.889684	.092908	.206814	.187738	1.029844
1.2	.058228	.184360	.135694	1.501282	.072820	.156896	.141328	.753824
1.3	.053942	.158404	.114034	1.196934	.057542	.119816	.106960	.554006
1.4	.050106	.136626	.096102	.957570	.045852	.092136	.081400	.408878
1.5	.046666	.118278	.081210	.768638	.036854	.071364	.062302	.303110
1.6	.043574	.102760	.068810	.618980	.029884	.055688	.047964	.225744
1.7	.040790	.089586	.058452	.500018	.024450	.043790	.037146	.168934
1.8	.038276	.078356	.049774	.405138	.020184	.034702	.028942	.127050
1.9	.036000	.068752	.042486	.329212	.016814	.027718	.022686	.096038
2.0	.033936	.060504	.036346	.268260	.014134	.022314	.017892	.072974
2.2	.030352	.047256	.026774	.179528	.010252	.014802	.011328	.042806
2.4	.027364	.037290	.019878	.121320	.007694	.010116	.007342	.025648
2.6	.024852	.029702	.014866	.082714	.005958	.007110	.004864	.015692
2.8	.022724	.023854	.011190	.056846	.004748	.005126	.003290	.009794
3.0	.020906	.019302	.008474	.039354	.003882	.003780	.002266	.006230
3.5	.017372	.011688	.004326	.016126	.002572	.001912	.000956	.002158
4.0	.014838	.007310	.002266	.006824	.001884	.001054	.000436	.000812
4.5	.012952	.004688	.001214	.002960	.001478	.000618	.000210	.000324
5.0	.011502	.003068	.000660	.001310	.001218	.000376	.000106	.000134
6.0	.009434	.001376	.000204	.000268	.000910	.000152	.000028	.000026
7.0	.008040	.000646	.000066	.000058	.000738	.000066	.000008	.000006
8.0	.007038	.000312	.000022	.000012	.000632	.000030	.000002	.000002
9.0	.006288	.000156	.000008	.000002	.000562	.000014	.000000	.000000
10.0	.005704	.000078	.000002	.000000	.000512	.000008	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	NILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.860462	3.765722	6.311974	9.437796	.905094	3.443742	3.437228	14.047240
.2	1.725694	3.207206	5.289272	7.423510	.684402	2.509882	2.502556	9.990624
.3	1.605178	2.743130	4.446242	5.864028	.520310	1.835612	1.827842	7.119392
.4	1.497148	2.355904	3.749020	4.651408	.397772	1.347478	1.339534	5.083968
.5	1.400084	2.031436	3.170492	3.704450	.305852	.993088	.985178	3.638626
.6	1.312660	1.758424	2.688894	2.961824	.236578	.735024	.727290	2.610458
.7	1.233732	1.527750	2.286720	2.377006	.184120	.546498	.539042	1.877654
.8	1.162302	1.332060	1.949822	1.914584	.144200	.408302	.401188	1.354296
.9	1.097504	1.165380	1.666758	1.547492	.113670	.306630	.299898	.979706
1.0	1.038586	1.022856	1.428220	1.254948	.090200	.231538	.225210	.710962
1.1	.984882	.900530	1.226638	1.020938	.072060	.175852	.169934	.517678
1.2	.935820	.795142	1.055814	.833074	.057968	.134374	.128862	.378292
1.3	.890894	.704030	.910672	.681736	.046962	.103336	.098220	.277490
1.4	.849660	.624990	.787034	.559410	.038316	.080000	.075260	.204366
1.5	.811732	.556190	.681458	.460220	.031488	.062360	.057982	.151150
1.6	.776768	.496116	.591094	.379542	.026064	.048956	.044918	.112288
1.7	.744464	.443504	.513576	.313732	.021734	.038714	.034992	.083806
1.8	.714556	.397292	.446934	.259898	.018256	.030840	.027416	.062850
1.9	.686808	.356590	.389528	.215746	.015448	.024750	.021602	.047368
2.0	.661014	.320648	.339980	.179444	.013166	.020012	.017116	.035884
2.2	.614568	.260590	.260020	.124808	.009772	.013372	.010930	.020918
2.4	.573970	.213094	.199832	.087378	.007456	.009192	.007132	.012456
2.6	.538236	.175218	.154244	.061532	.005842	.006486	.004750	.007574
2.8	.506572	.144786	.119522	.043556	.004692	.004690	.003226	.004702
3.0	.478340	.120172	.092942	.030978	.003854	.003466	.002228	.002976
3.5	.419624	.076690	.050220	.013446	.002564	.001758	.000944	.001022
4.0	.373536	.049920	.027564	.005956	.001878	.000970	.000430	.000382
4.5	.336412	.033018	.015320	.002682	.001472	.000568	.000208	.000152
5.0	.305860	.022128	.008604	.001224	.001212	.000346	.000104	.000064
6.0	.258520	.010258	.002780	.000262	.000906	.000140	.000028	.000012
7.0	.223514	.004914	.000922	.000058	.000738	.000062	.000008	.000002
8.0	.196566	.002414	.000312	.000014	.000634	.000028	.000002	.000000
9.0	.175184	.001210	.000106	.000004	.000564	.000014	.000000	.000000
10.0	.157810	.000616	.000038	.000000	.000516	.000006	.000000	.000000

TABLE 12 D. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 15 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.160040	1.230406	1.061732	21.767900	1.649086	5.260362	4.986852	47.063800
.2	.144016	1.020216	.871106	17.016980	1.216910	3.821568	3.618516	33.655880
.3	.129976	.849394	.716888	13.353280	.902530	2.786458	2.634388	24.116840
.4	.117650	.710076	.591762	10.517110	.672986	2.039696	1.924704	17.318600
.5	.106808	.596046	.489944	8.313194	.504722	1.499354	1.411486	12.464900
.6	.097250	.502370	.406850	6.594232	.380862	1.107134	1.039228	8.992912
.7	.088810	.425132	.338840	5.248558	.289280	.821466	.768360	6.504350
.8	.081338	.361208	.283012	4.191334	.221244	.612650	.570602	4.716898
.9	.074710	.308104	.237050	3.357804	.170448	.459424	.425710	3.430198
1.0	.068820	.263822	.199102	2.698378	.132326	.346524	.319154	2.501814
1.1	.063570	.226756	.167680	2.174948	.103556	.262976	.240480	1.830326
1.2	.058884	.195614	.141588	1.758116	.081718	.200862	.182152	1.343402
1.3	.054692	.169350	.119860	1.425120	.065044	.154454	.138720	.989360
1.4	.050930	.147118	.101718	1.158288	.052232	.119602	.106236	.731210
1.5	.047550	.128228	.086528	.943840	.042324	.093286	.081822	.542420
1.6	.044504	.112122	.073776	.770994	.034610	.073300	.063384	.403926
1.7	.041754	.098342	.063044	.631296	.028562	.058030	.049390	.301998
1.8	.039264	.086508	.053990	.518088	.023790	.046294	.038714	.226726
1.9	.037008	.076312	.046330	.426108	.019994	.037212	.030524	.170944
2.0	.034956	.067500	.039836	.351192	.016956	.030140	.024206	.129450
2.2	.031382	.053210	.029616	.239976	.012516	.020216	.015490	.075246
2.4	.028388	.042336	.022172	.165190	.009544	.013952	.010134	.044556
2.6	.025864	.033966	.016706	.114480	.007498	.009884	.006768	.026882
2.8	.023714	.027456	.012660	.079828	.006050	.007172	.004608	.016522
3.0	.021872	.022346	.009644	.055980	.005000	.005314	.003192	.010342
3.5	.018270	.013694	.004986	.023560	.003374	.002710	.001360	.003448
4.0	.015668	.008644	.002640	.010178	.002494	.001500	.000624	.001258
4.5	.013720	.005584	.001424	.004490	.001962	.000878	.000302	.000490
5.0	.012214	.003674	.000780	.002016	.001614	.000536	.000152	.000202
6.0	.010054	.001660	.000244	.000422	.001198	.000216	.000042	.000038
7.0	.008586	.000782	.000078	.000092	.000962	.000094	.000012	.000008
8.0	.007530	.000380	.000026	.000020	.000816	.000044	.000004	.000002
9.0	.006734	.000188	.000008	.000004	.000716	.000020	.000002	.000000
10.0	.006112	.000096	.000004	.000002	.000646	.000010	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.813696	3.542002	5.841606	8.360858	.926702	3.827532	3.845378	21.893880
.2	1.685562	3.043180	4.935184	6.690768	.702998	2.809736	2.820082	15.743710
.3	1.570800	2.624886	4.181242	5.375654	.536376	2.070506	2.075390	11.343920
.4	1.467770	2.272716	3.552196	4.335560	.411704	1.531996	1.532958	8.190838
.5	1.375052	1.975030	3.025766	3.509472	.317976	1.138464	1.136660	5.927104
.6	1.291416	1.722402	2.583910	2.850668	.247166	.849914	.846212	4.298802
.7	1.215792	1.507184	2.211962	2.323204	.193396	.637594	.632638	3.125264
.8	1.147250	1.323132	1.897982	1.899276	.152356	.480778	.475042	2.277754
.9	1.084978	1.165148	1.632216	1.557324	.120862	.364500	.358334	1.664388
1.0	1.028270	1.029046	1.406652	1.280526	.096560	.277918	.271574	1.219494
1.1	.976506	.911380	1.214728	1.055724	.077706	.213166	.206824	.896052
1.2	.929150	.809308	1.051022	.872572	.062992	.164516	.158302	.660342
1.3	.885720	.720468	.911050	.722900	.051446	.127788	.121786	.488134
1.4	.845808	.642902	.791104	.600238	.042330	.099916	.094182	.361994
1.5	.809044	.574970	.688088	.499436	.035092	.078656	.073222	.269344
1.6	.775108	.515304	.599430	.416390	.029312	.062348	.057234	.201102
1.7	.743714	.462750	.522978	.347800	.024666	.049768	.044976	.150688
1.8	.714610	.416336	.456920	.291020	.020912	.040006	.035534	.113332
1.9	.687576	.375242	.399744	.243916	.017860	.032386	.028226	.085562
2.0	.662416	.338770	.350168	.204756	.015364	.026400	.022540	.064852
2.2	.617032	.277402	.269656	.144916	.011610	.017904	.014598	.037712
2.4	.577280	.228430	.208558	.103108	.009012	.012464	.009646	.022302
2.6	.542216	.189050	.161934	.073708	.007170	.008888	.006496	.013418
2.8	.511086	.157164	.126178	.052916	.005838	.006480	.004450	.008214
3.0	.483284	.131186	.098630	.038132	.004852	.004820	.003098	.005114
3.5	.425296	.084782	.053926	.017052	.003298	.002470	.001330	.001680
4.0	.379618	.055786	.029908	.007756	.002442	.001370	.000612	.000604
4.5	.342710	.037242	.016780	.003574	.001922	.000804	.000296	.000234
5.0	.312256	.025158	.009502	.001666	.001584	.000490	.000148	.000096
6.0	.264900	.011808	.003116	.000372	.001178	.000198	.000040	.000018
7.0	.229740	.005708	.001046	.000084	.000950	.000086	.000012	.000004
8.0	.202578	.002820	.000358	.000020	.000806	.000040	.000004	.000000
9.0	.180956	.001418	.000124	.000004	.000712	.000018	.000002	.000000
10.0	.163338	.000724	.000044	.000002	.000644	.000010	.000000	.000000

TABLE 12 E. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 20 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.156640	1.175438	1.000240	20.188540	1.750236	6.124216	5.840130	65.952660
.2	.141388	.984818	.828726	16.023420	1.294150	4.463222	4.250798	47.423480
.3	.127994	.828302	.688580	12.765000	.961988	3.265200	3.104810	34.176720
.4	.116206	.699338	.573738	10.205570	.719146	2.398556	2.276154	24.687900
.5	.105814	.592702	.479366	8.187244	.540878	1.769662	1.675178	17.877050
.6	.096630	.504214	.401598	6.589574	.409438	1.311770	1.237944	12.978000
.7	.088500	.430526	.337332	5.320228	.312078	.977198	.918784	9.446322
.8	.081284	.368942	.284080	4.308158	.239604	.731808	.684990	6.894514
.9	.074870	.317294	.239834	3.498504	.185376	.551106	.513100	5.046308
1.0	.069152	.273822	.202974	2.848670	.144576	.417470	.386232	3.704380
1.1	.064046	.237104	.172184	2.325484	.113704	.318200	.292212	2.727552
1.2	.059476	.205984	.146400	1.903014	.090202	.244104	.222240	2.014596
1.3	.055378	.179516	.124754	1.560904	.072198	.188522	.169936	1.492802
1.4	.051692	.156928	.106536	1.283122	.058316	.146606	.130658	1.109826
1.5	.048372	.137588	.091166	1.056988	.047540	.114826	.101022	.827916
1.6	.045372	.120974	.078170	.872446	.039116	.090588	.078550	.619774
1.7	.042658	.106656	.067154	.721494	.032486	.071994	.061428	.465618
1.8	.040198	.094278	.057798	.597742	.027228	.057640	.048312	.351084
1.9	.037960	.083546	.049834	.496072	.023028	.046492	.038212	.265706
2.0	.035922	.074212	.043040	.412374	.019650	.037774	.030394	.201852
2.2	.032358	.058954	.032262	.286290	.014674	.025476	.019550	.117842
2.4	.029362	.047222	.024328	.199904	.011310	.017658	.012844	.069878
2.6	.026824	.038110	.018448	.140322	.008970	.012552	.008608	.042092
2.8	.024656	.030966	.014060	.098976	.007296	.009128	.005874	.025756
3.0	.022792	.025318	.010766	.070126	.006068	.006776	.004078	.016006
3.5	.019126	.015662	.005624	.030146	.004140	.003462	.001742	.005198
4.0	.016460	.009956	.003002	.013238	.003076	.001916	.000798	.001834
4.5	.014452	.006468	.001630	.005916	.002424	.001122	.000386	.000694
5.0	.012892	.004274	.000898	.002684	.001994	.000684	.000194	.000278
6.0	.010644	.001944	.000282	.000572	.001474	.000276	.000052	.000050
7.0	.009108	.000918	.000092	.000126	.001178	.000120	.000016	.000010
8.0	.007996	.000448	.000030	.000028	.000990	.000054	.000004	.000002
9.0	.007156	.000222	.000010	.000006	.000864	.000026	.000002	.000000
10.0	.006500	.000112	.000004	.000002	.000774	.000012	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.765708	3.339846	5.418860	7.485888	.946760	4.180242	4.209298	27.923140
.2	1.644348	2.892454	4.611000	6.058642	.720350	3.087626	3.106334	20.275440
.3	1.535456	2.514100	3.933706	4.922250	.551434	2.289948	2.300950	14.756950
.4	1.437518	2.192898	3.364216	4.013438	.424810	1.705696	1.711010	10.766420
.5	1.349228	1.919174	2.884016	3.283556	.329414	1.276302	1.277472	7.874478
.6	1.269446	1.685036	2.477992	2.695000	.257178	.959582	.957786	5.773976
.7	1.197178	1.484028	2.133768	2.218588	.202188	.725088	.721214	4.244786
.8	1.131568	1.310840	1.841180	1.831544	.160094	.550782	.545506	3.128898
.9	1.071856	1.161106	1.591862	1.516012	.127694	.420680	.414504	2.312630
1.0	1.017390	1.031212	1.378904	1.257944	.102610	.323144	.316446	1.714050
1.1	.967594	.918158	1.196580	1.046228	.083078	.249694	.242750	1.273998
1.2	.921960	.819454	1.040142	.872030	.067776	.194120	.187130	.949646
1.3	.880052	.733016	.905624	.728316	.055716	.151864	.144972	.709946
1.4	.841474	.657098	.789718	.609444	.046156	.119568	.112876	.532330
1.5	.805888	.590232	.689654	.510884	.038528	.094756	.088330	.400358
1.6	.772992	.531184	.603108	.428980	.032406	.075590	.069472	.302026
1.7	.742518	.478904	.528120	.360776	.027460	.060702	.054918	.228554
1.8	.714230	.432504	.463034	.303862	.023442	.049072	.043630	.173500
1.9	.687918	.391228	.406452	.256284	.020158	.039932	.034836	.132126
2.0	.663400	.354426	.357186	.216436	.017456	.032708	.027952	.100944
2.2	.619096	.292112	.276720	.154928	.013360	.022366	.018256	.059496
2.4	.580198	.241988	.215210	.111388	.010492	.015672	.012144	.035530
2.6	.545814	.201384	.167960	.080400	.008434	.011232	.008220	.021502
2.8	.515230	.168282	.131498	.058238	.006928	.008220	.005654	.013186
3.0	.487864	.141140	.103246	.042320	.005802	.006130	.003948	.008196
3.5	.430624	.092200	.057018	.019280	.003996	.003152	.001700	.002642
4.0	.385372	.061226	.031900	.008910	.002978	.001748	.000782	.000918
4.5	.348694	.041198	.018038	.004166	.002352	.001024	.000378	.000342
5.0	.318346	.028022	.010288	.001966	.001938	.000626	.000190	.000134
6.0	.270992	.013300	.003416	.000448	.001436	.000252	.000052	.000024
7.0	.235690	.006480	.001158	.000104	.001150	.000110	.000016	.000004
8.0	.208322	.003222	.000400	.000024	.000972	.000050	.000004	.000000
9.0	.186470	.001626	.000140	.000006	.000852	.000024	.000002	.000000
10.0	.168616	.000832	.000050	.000002	.000766	.000012	.000000	.000000

TABLE 12 F. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 25 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.153218	1.127600	.947170	18.727210	1.841226	6.956294	6.655724	84.185400
.2	.138742	.953194	.791018	15.021240	1.363636	5.082498	4.856456	60.797980
.3	.125994	.808742	.662414	12.093640	1.015480	3.728244	3.556500	44.018280
.4	.114742	.688682	.556192	9.770966	.760674	2.746466	2.614518	31.952800
.5	.104794	.588540	.468212	7.920724	.573400	2.032372	1.929790	23.257100
.6	.095980	.504720	.395136	6.441028	.435140	1.511168	1.430418	16.975070
.7	.088154	.434318	.334276	5.253256	.332576	1.129346	1.064962	12.425600
.8	.081190	.374982	.283456	4.296440	.256106	.848530	.796532	9.122340
.9	.074982	.324800	.240910	3.523090	.198786	.641148	.598616	6.717618
1.0	.069434	.282220	.205198	2.896036	.155576	.487324	.452106	4.962208
1.1	.064466	.245966	.175150	2.386090	.122810	.372698	.343198	3.677196
1.2	.060008	.215002	.149808	1.970206	.097808	.286870	.261890	2.733808
1.3	.056000	.188468	.128384	1.630128	.078608	.222276	.200914	2.039170
1.4	.052386	.165662	.110232	1.351348	.063764	.173406	.154974	1.526142
1.5	.049122	.145998	.094818	1.122274	.052206	.136226	.120196	1.146068
1.6	.046168	.128994	.081702	.933624	.043146	.107780	.093738	.863608
1.7	.043488	.114246	.070518	.777938	.035990	.085884	.073510	.653018
1.8	.041052	.101420	.060962	.649206	.030298	.068928	.057966	.495500
1.9	.038832	.090234	.052784	.542558	.025736	.055716	.045960	.377294
2.0	.036806	.080452	.045770	.454052	.022052	.045356	.036638	.288292
2.2	.033252	.064342	.034560	.319220	.016598	.030686	.023654	.170094
2.4	.030252	.051840	.026234	.225490	.012882	.021312	.015582	.101758
2.6	.027702	.042052	.020008	.159964	.010278	.015170	.010462	.061714
2.8	.025518	.034322	.015330	.113928	.008402	.011038	.007148	.037932
3.0	.023632	.028170	.011792	.081432	.007018	.008194	.004962	.023620
3.5	.019906	.017564	.006218	.035670	.004822	.004184	.002116	.007628
4.0	.017180	.011230	.003344	.015896	.003594	.002312	.000968	.002644
4.5	.015118	.007328	.001826	.007188	.002836	.001352	.000466	.000974
5.0	.013510	.004860	.001010	.003292	.002334	.000822	.000234	.000378
6.0	.011180	.002220	.000320	.000712	.001720	.000332	.000064	.000064
7.0	.009580	.001054	.000104	.000158	.001370	.000144	.000018	.000012
8.0	.008420	.000514	.000034	.000036	.001148	.000066	.000006	.000002
9.0	.007540	.000256	.000012	.000008	.000996	.000032	.000002	.000000
10.0	.006850	.000130	.000004	.000002	.000890	.000016	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.718074	3.167670	5.069284	6.789962	.964574	4.489916	4.520650	32.683320
.2	1.603562	2.761770	4.338212	5.538508	.735836	3.334606	3.354388	23.920680
.3	1.500584	2.416084	3.721496	4.534502	.564920	2.487308	2.498888	17.555350
.4	1.407762	2.120562	3.199792	3.725406	.436576	1.863716	1.869210	12.919900
.5	1.323898	1.866996	2.757250	3.070604	.339706	1.403082	1.404116	9.535462
.6	1.247956	1.648642	2.380874	2.538534	.266198	1.061520	1.059330	7.057930
.7	1.179028	1.459954	2.059958	2.104564	.210110	.807228	.802766	5.239390
.8	1.116318	1.296344	1.785662	1.749338	.167070	.617124	.611110	3.900912
.9	1.059140	1.154010	1.550670	1.457604	.133852	.474388	.467366	2.913020
1.0	1.006880	1.029796	1.348898	1.217260	.108060	.366734	.359114	2.181830
1.1	.959012	.921062	1.175276	1.018678	.087912	.285164	.277248	1.639090
1.2	.915070	.825596	1.025574	.854156	.072078	.223058	.215072	1.235070
1.3	.874642	.741546	.896242	.717502	.059554	.175538	.167642	.933442
1.4	.837364	.667344	.784300	.603734	.049590	.138992	.131302	.707600
1.5	.802924	.601670	.687240	.508802	.041608	.110742	.103334	.538008
1.6	.771036	.543398	.602938	.429430	.035178	.088784	.081714	.410282
1.7	.741450	.491572	.529600	.362936	.029962	.071628	.064922	.313806
1.8	.713948	.445378	.465704	.307134	.025706	.058148	.051824	.240722
1.9	.688334	.404112	.409952	.260226	.022212	.047496	.041558	.185196
2.0	.664430	.367176	.361236	.220730	.019326	.039034	.033478	.142890
2.2	.621156	.304290	.281278	.159310	.014922	.026836	.022012	.085792
2.4	.583074	.253354	.219778	.115416	.011810	.018876	.014720	.052086
2.6	.549338	.211828	.172264	.083898	.009560	.013562	.010000	.031970
2.8	.519270	.177778	.135408	.061172	.007900	.009938	.006894	.019832
3.0	.492312	.149708	.106712	.044724	.006646	.007414	.004820	.012430
3.5	.435772	.098678	.059420	.020652	.004616	.003808	.002076	.004038
4.0	.390908	.066038	.033484	.009656	.003458	.002110	.000952	.001390
4.5	.354430	.044736	.019052	.004560	.002736	.001234	.000458	.000506
5.0	.324166	.030610	.010928	.002170	.002254	.000752	.000230	.000194
6.0	.276786	.014672	.003664	.000502	.001666	.000304	.000062	.000032
7.0	.241320	.007204	.001254	.000118	.001332	.000132	.000018	.000006
8.0	.213734	.003602	.000436	.000028	.001120	.000060	.000006	.000002
9.0	.191640	.001826	.000152	.000006	.000976	.000028	.000002	.000000
10.0	.173544	.000936	.000054	.000002	.000874	.000014	.000000	.000000

TABLE 12 G. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 30 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^3 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.150588	1.082670	.898224	17.461260	1.931550	7.737494	7.430336	101.462500
.2	.136804	.922114	.755054	14.113970	1.432360	5.664912	5.432596	73.515020
.3	.124624	.788182	.636388	11.450900	1.068180	4.164614	3.987002	53.412720
.4	.113844	.676058	.537746	9.322800	.801420	3.075076	2.937718	38.918220
.5	.104282	.581858	.455518	7.615046	.605172	2.281130	2.173602	28.440880
.6	.095784	.502436	.386780	6.239114	.460134	1.700490	1.615246	20.847520
.7	.088218	.435246	.329164	5.126370	.352418	1.274218	1.205768	15.329350
.8	.081464	.378206	.280746	4.223258	.272004	.960006	.904334	11.307980
.9	.075426	.329626	.239956	3.487852	.211642	.727404	.681560	8.368928
1.0	.070014	.288114	.205504	2.887126	.166068	.554440	.516240	6.214492
1.1	.065156	.252530	.176340	2.395004	.131452	.425220	.393030	4.630358
1.2	.060784	.221934	.151596	1.990730	.104992	.328200	.300796	3.461926
1.3	.056842	.195544	.130554	1.657786	.084632	.254984	.231432	2.597338
1.4	.053280	.172718	.112624	1.382932	.068860	.199432	.179024	1.955500
1.5	.050054	.152918	.097316	1.155522	.056554	.157052	.139234	1.477442
1.6	.047128	.135694	.084218	.966982	.046882	.124534	.108876	1.120182
1.7	.044466	.120672	.072992	.810362	.039228	.099434	.085598	.852294
1.8	.042042	.107536	.063352	.680024	.033122	.079948	.067658	.650736
1.9	.039828	.096020	.055060	.571370	.028216	.064722	.053760	.498568
2.0	.037802	.085902	.047916	.480650	.024244	.052756	.042942	.383294
2.2	.034240	.069122	.036424	.341264	.018342	.035752	.027814	.228842
2.4	.031222	.055992	.027816	.243282	.014300	.024850	.018366	.138432
2.6	.028648	.045634	.021332	.174066	.011452	.017684	.012348	.084804
2.8	.026434	.037398	.016422	.124956	.009392	.012858	.008442	.052582
3.0	.024518	.030806	.012690	.089974	.007862	.009532	.005860	.032980
3.5	.020718	.019344	.006752	.040050	.005426	.004844	.002492	.010764
4.0	.017924	.012434	.003656	.018086	.004052	.002664	.001134	.003730
4.5	.015798	.008146	.002008	.008268	.003198	.001552	.000544	.001362
5.0	.014136	.005418	.001116	.003818	.002630	.000942	.000270	.000520
6.0	.011720	.002486	.000356	.000836	.001936	.000378	.000074	.000086
7.0	.010054	.001184	.000116	.000188	.001538	.000164	.000022	.000016
8.0	.008842	.000578	.000040	.000044	.001286	.000074	.000006	.000004
9.0	.007922	.000288	.000014	.000010	.001114	.000036	.000002	.000000
10.0	.007198	.000146	.000004	.000002	.000992	.000018	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^3 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.680012	3.012310	4.759710	6.235104	.985088	4.751914	4.787510	36.597520
.2	1.571676	2.640936	4.092172	5.115026	.753220	3.546212	3.569002	26.943480
.3	1.474000	2.322836	3.526272	4.211428	.579722	2.658520	2.671826	19.897690
.4	1.385744	2.049338	3.045212	3.479176	.449238	2.002492	2.008830	14.740790
.5	1.305814	1.813340	2.635192	2.883236	.350582	1.515770	1.517042	10.955350
.6	1.233258	1.608982	2.284812	2.396294	.275578	1.153188	1.150830	8.168322
.7	1.167254	1.431420	1.984676	1.996916	.218234	.881940	.877032	6.110108
.8	1.107072	1.276630	1.726980	1.668210	.174134	.678128	.671486	4.585428
.9	1.052078	1.141274	1.505226	1.396794	.140016	.524294	.516528	3.452448
1.0	1.001714	1.022546	1.314000	1.172000	.113458	.407644	.399208	2.607872
1.1	.955488	.918100	1.148762	.985296	.092658	.318762	.309996	1.976290
1.2	.912970	.825970	1.005712	.829826	.076264	.250710	.241858	1.502474
1.3	.873782	.744482	.881640	.700052	.063260	.198344	.189584	1.145890
1.4	.837582	.672226	.773844	.591484	.052880	.157842	.149304	.876672
1.5	.804080	.608000	.680032	.500470	.044540	.126354	.118124	.672776
1.6	.773010	.550782	.598266	.424024	.037798	.101748	.093880	.517868
1.7	.744138	.499694	.526892	.359700	.032314	.082414	.074948	.399814
1.8	.717260	.453986	.464502	.305488	.027824	.067144	.060094	.309568
1.9	.692188	.413010	.409892	.259724	.024124	.055020	.048392	.240374
2.0	.668760	.376206	.362030	.221040	.021058	.045340	.039132	.187164
2.2	.626262	.313244	.283140	.160544	.016356	.031302	.025900	.114388
2.4	.588772	.261938	.222134	.116996	.013012	.022072	.017408	.070630
2.6	.555488	.219880	.174766	.085514	.010580	.015876	.011870	.044038
2.8	.525760	.185216	.137854	.062668	.008774	.011632	.008204	.027710
3.0	.499060	.156506	.108992	.046036	.007404	.008668	.005742	.017588
3.5	.442896	.103946	.061130	.021486	.005168	.004430	.002470	.005848
4.0	.398170	.070018	.034658	.010136	.003880	.002440	.001128	.002036
4.5	.361694	.047704	.019826	.004824	.003072	.001420	.000540	.000740
5.0	.331352	.032804	.011426	.002314	.002532	.000862	.000268	.000280
6.0	.283688	.015856	.003864	.000542	.001870	.000346	.000072	.000044
7.0	.247872	.007838	.001330	.000128	.001490	.000150	.000022	.000008
8.0	.219920	.003940	.000464	.000032	.001250	.000068	.000006	.000002
9.0	.197472	.002008	.000164	.000008	.001086	.000032	.000002	.000000
10.0	.179040	.001034	.000058	.000002	.000970	.000016	.000000	.000000

TABLE 12 H. CRRES Omnidirectional Geometric Factors for Power Law Spectra
Mirror Plane Path Length Distribution, λ = 35 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.147934	1.043468	.856588	16.388230	2.012342	8.476186	8.157534	117.769300
.2	.134830	.894302	.723736	13.322860	1.493780	6.216268	5.974130	85.539820
.3	.123216	.769146	.613088	10.871230	1.115234	4.578290	4.392252	62.314900
.4	.112900	.663746	.520660	8.901530	.837760	3.387126	3.242512	45.535500
.5	.103720	.574662	.443228	7.312240	.633476	2.517824	2.404022	33.380020
.6	.095538	.499104	.378180	6.024662	.482372	1.881036	1.790348	24.549440
.7	.088226	.434796	.323384	4.977572	.370044	1.412724	1.339536	18.115680
.8	.081682	.379878	.277106	4.123014	.286102	1.066874	1.007064	13.414010
.9	.075814	.332824	.237924	3.423274	.223022	.810340	.760870	9.967452
1.0	.070538	.292382	.204670	2.848522	.175340	.619178	.577788	7.432842
1.1	.065788	.257514	.176382	2.375092	.139074	.476042	.441038	5.562774
1.2	.061502	.227364	.152266	1.984074	.111312	.368326	.338432	4.178370
1.3	.057628	.201214	.131664	1.660322	.089920	.286840	.261084	3.150002
1.4	.054116	.178474	.114026	1.391650	.073320	.224866	.202494	2.383452
1.5	.050930	.158646	.098898	1.168214	.060348	.177466	.157898	1.810046
1.6	.048030	.141310	.085900	.982024	.050136	.141004	.123784	1.379596
1.7	.045388	.126118	.074710	.826592	.042038	.112794	.097556	1.055312
1.8	.042974	.112770	.065062	.696612	.035566	.090836	.077288	.810136
1.9	.040766	.101016	.056730	.587742	.030358	.073640	.061548	.624108
2.0	.038742	.090644	.049522	.496420	.026132	.060094	.049260	.482456
2.2	.035170	.073340	.037864	.355194	.019836	.040790	.032020	.291220
2.4	.032136	.059696	.029070	.255060	.015510	.028368	.021202	.178062
2.6	.029536	.048860	.022402	.183744	.012450	.020180	.014282	.110204
2.8	.027294	.040194	.017324	.132756	.010230	.014658	.009774	.068988
3.0	.025350	.033218	.013440	.096168	.008578	.010848	.006788	.043650
3.5	.021476	.020996	.007214	.043390	.005934	.005482	.002882	.014498
4.0	.018612	.013562	.003932	.019822	.004436	.002998	.001306	.005074
4.5	.016428	.008916	.002170	.009150	.003506	.001738	.000622	.001856
5.0	.014714	.005948	.001212	.004262	.002884	.001052	.000308	.000706
6.0	.012216	.002740	.000388	.000946	.002122	.000420	.000082	.000112
7.0	.010488	.001308	.000128	.000214	.001684	.000182	.000024	.000020
8.0	.009228	.000640	.000044	.000050	.001404	.000082	.000008	.000004
9.0	.008268	.000320	.000014	.000012	.001216	.000040	.000002	.000000
10.0	.007514	.000162	.000006	.000002	.001080	.000018	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)
multiply by 10^{-3}

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.642184	2.881556	4.507664	5.791514	1.002498	4.970926	5.003500	39.696480
.2	1.539930	2.537874	3.889284	4.771164	.768162	3.725686	3.745448	29.368620
.3	1.447492	2.242100	3.363120	3.944684	.592574	2.805734	2.816122	21.801740
.4	1.363746	1.986614	2.914180	3.272166	.460320	2.123384	2.126982	16.240320
.5	1.287704	1.765132	2.530128	2.722580	.360160	1.615174	1.613894	12.139760
.6	1.218514	1.572468	2.200754	2.271662	.283880	1.235026	1.230314	9.106440
.7	1.155412	1.404306	1.917606	1.900322	.225446	.949406	.942342	6.855098
.8	1.097744	1.257066	1.673638	1.593456	.180416	.733828	.725212	5.178520
.9	1.044928	1.127748	1.462978	1.339052	.145502	.570344	.560778	3.925694
1.0	.996450	1.013840	1.280708	1.127520	.118264	.445772	.435694	2.986318
1.1	.951864	.913226	1.122692	.951154	.096878	.350382	.340116	2.279536
1.2	.910768	.824116	.985456	.803736	.079980	.276972	.266754	1.745928
1.3	.872816	.745000	.866060	.680230	.066544	.220190	.210184	1.341686
1.4	.837694	.674584	.762012	.576530	.055788	.176046	.166368	1.034402
1.5	.805130	.611772	.671200	.489294	.047126	.141550	.132276	.800036
1.6	.774874	.555618	.591822	.415770	.040104	.114452	.105630	.620692
1.7	.746716	.505314	.522344	.353698	.034374	.093056	.084712	.483006
1.8	.720458	.460166	.461450	.301214	.029672	.076074	.068220	.376960
1.9	.695930	.419564	.408014	.256770	.025786	.062528	.055160	.295032
2.0	.672974	.382992	.361066	.219088	.022558	.051664	.044776	.231542
2.2	.631252	.320170	.283414	.159906	.017590	.035816	.029836	.143732
2.4	.594354	.268710	.223100	.117066	.014040	.025320	.020166	.090102
2.6	.561520	.226328	.176076	.085934	.011446	.018232	.013810	.057000
2.8	.532132	.191240	.139290	.063232	.009510	.013356	.009574	.036364
3.0	.505686	.162064	.110428	.046628	.008040	.009942	.006714	.023382
3.5	.449898	.108328	.062306	.021950	.005628	.005054	.002890	.007992
4.0	.405312	.073370	.035508	.010432	.004230	.002762	.001314	.002840
4.5	.368838	.050224	.020404	.004998	.003352	.001598	.000626	.001044
5.0	.338418	.034682	.011804	.002410	.002762	.000964	.000308	.000396
6.0	.290476	.016884	.004018	.000568	.002038	.000384	.000082	.000062
7.0	.254308	.008394	.001392	.000136	.001622	.000166	.000024	.000010
8.0	.225988	.004240	.000488	.000034	.001360	.000076	.000008	.000002
9.0	.203180	.002168	.000174	.000008	.001180	.000036	.000002	.000000
10.0	.184406	.001120	.000062	.000002	.001052	.000018	.000000	.000000

TABLE 12 I. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 40 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.145410	1.009426	.820332	15.485160	2.088974	9.149212	8.834934	132.932300
.2	.132934	.869506	.696040	12.642110	1.551914	6.719082	6.478488	96.733340
.3	.121842	.751566	.592104	10.359550	1.159670	4.956000	4.769674	70.613140
.4	.111962	.651778	.504926	8.518492	.871996	3.672456	3.526424	51.713760
.5	.103142	.567036	.431594	7.027020	.660072	2.734618	2.618742	38.000220
.6	.095256	.494814	.369732	5.813788	.503208	2.046730	1.953618	28.020060
.7	.088188	.433048	.317406	4.823112	.386512	1.540120	1.464366	20.734520
.8	.081846	.380046	.273032	4.011274	.299234	1.165412	1.103036	15.399110
.9	.076140	.334416	.235310	3.343784	.233584	.887016	.835056	11.478970
1.0	.070996	.295010	.203164	2.793284	.183912	.679200	.635446	8.588954
1.1	.066354	.260874	.175708	2.337982	.146092	.523302	.486092	6.450970
1.2	.062152	.231218	.152210	1.960424	.117110	.405754	.373820	4.863712
1.3	.058342	.205384	.132058	1.646574	.094748	.316652	.289020	3.681066
1.4	.054884	.182816	.114740	1.385096	.077374	.248740	.224658	2.796654
1.5	.051734	.163054	.099830	1.166802	.063778	.196686	.175564	2.132822
1.6	.048864	.145702	.086972	.984208	.053060	.156560	.137928	1.632704
1.7	.046242	.130432	.075866	.831206	.044550	.125444	.108930	1.254512
1.8	.043840	.116966	.066256	.702792	.037740	.101172	.086472	.967454
1.9	.041640	.105062	.057928	.594848	.032248	.082126	.068992	.748762
2.0	.039616	.094516	.050700	.503984	.027790	.067090	.055316	.581536
2.2	.036040	.076838	.038958	.362766	.021132	.045604	.036068	.354362
2.4	.032986	.062808	.030046	.261980	.016544	.031734	.023942	.218722
2.6	.030364	.051600	.023252	.189748	.013292	.022568	.016158	.136628
2.8	.028098	.042588	.018050	.137794	.010928	.016374	.011070	.086300
3.0	.026124	.035298	.014052	.100302	.009166	.012098	.007690	.055070
3.5	.022178	.022442	.007600	.045756	.006340	.006078	.003260	.018636
4.0	.019250	.014558	.004168	.021102	.004738	.003302	.001470	.006616
4.5	.017008	.009600	.002312	.009822	.003742	.001902	.000696	.002444
5.0	.015246	.006420	.001296	.004608	.003074	.001146	.000342	.000932
6.0	.012670	.002966	.000418	.001034	.002260	.000456	.000090	.000148
7.0	.010884	.001418	.000138	.000236	.001790	.000196	.000026	.000026
8.0	.009578	.000694	.000046	.000056	.001492	.000090	.000008	.000004
9.0	.008584	.000348	.000016	.000014	.001290	.000042	.000002	.000000
10.0	.007802	.000176	.000006	.000004	.001146	.000020	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL		multiply by 10^{-3}		LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.604086	2.766834	4.281940	5.424822	1.019306	5.157914	5.193576	42.223280
.2	1.507416	2.445558	3.705098	4.482510	.782518	3.879412	3.900778	31.359700
.3	1.419814	2.168076	3.212792	3.717050	.604880	2.932396	2.943348	23.376180
.4	1.340258	1.927522	2.791484	3.092364	.470900	2.227954	2.231404	17.489560
.5	1.267854	1.718232	2.429998	2.580382	.369286	1.701666	1.699772	13.134140
.6	1.201818	1.535518	2.119076	2.159086	.291772	1.306698	1.301072	9.900302
.7	1.141462	1.375478	1.851018	1.811122	.232292	1.008898	1.000742	7.490668
.8	1.086180	1.234862	1.619400	1.522738	.186368	.783292	.773490	5.688694
.9	1.035444	1.110936	1.418854	1.282974	.150694	.611538	.600750	4.336224
1.0	.988780	1.001416	1.244866	1.083052	.122802	.480132	.468836	3.317410
1.1	.945776	.904360	1.093634	.915908	.100856	.379084	.367634	2.547134
1.2	.906062	.818126	.961954	.775814	.083476	.300986	.289630	1.962636
1.3	.869320	.741330	.847104	.658134	.069624	.240310	.229226	1.517500
1.4	.835258	.672774	.746778	.559068	.058510	.192928	.182236	1.177284
1.5	.803622	.611444	.659008	.475516	.049536	.155736	.145514	.916338
1.6	.774182	.556462	.582118	.404924	.042244	.126390	.116688	.715494
1.7	.746740	.507076	.514668	.345184	.036282	.103116	.093958	.560388
1.8	.721112	.462636	.455424	.294554	.031374	.084564	.075956	.440204
1.9	.697138	.422576	.403332	.251582	.027312	.069702	.061642	.346780
2.0	.674672	.386400	.357472	.215066	.023928	.057736	.050210	.273930
2.2	.633762	.324056	.281412	.157538	.018706	.040184	.033668	.172258
2.4	.597496	.272774	.222122	.115724	.014958	.028482	.022876	.109366
2.6	.565156	.230370	.175744	.085220	.012210	.020536	.015734	.070050
2.8	.536156	.195142	.139352	.062896	.010156	.015046	.010944	.045228
3.0	.510014	.165750	.110714	.046512	.008590	.011190	.007692	.029416
3.5	.454728	.111354	.062768	.022036	.006016	.005656	.003318	.010322
4.0	.410404	.075740	.035916	.010532	.004520	.003068	.001504	.003748
4.5	.374054	.052038	.020710	.005070	.003578	.001760	.000712	.001402
5.0	.343672	.036050	.012018	.002454	.002946	.001056	.000348	.000538
6.0	.295666	.017646	.004110	.000584	.002172	.000418	.000092	.000084
7.0	.259344	.008812	.001430	.000140	.001728	.000180	.000026	.000014
8.0	.230830	.004468	.000504	.000034	.001446	.000082	.000008	.000002
9.0	.207814	.002292	.000178	.000008	.001254	.000038	.000002	.000000
10.0	.188830	.001186	.000064	.000002	.001116	.000018	.000000	.000000

TABLE 12 J. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 45 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.143020	.978942	.788418	14.669210	2.156234	9.785696	9.460156	147.060800
.2	.131104	.846830	.671178	12.018230	1.602896	7.194614	6.944218	107.169800
.3	.120480	.735046	.572836	9.882794	1.198610	5.313276	5.118454	78.355900
.4	.110992	.640098	.490094	8.154592	.901978	3.942462	3.789044	57.484300
.5	.102500	.559144	.420270	6.749814	.683348	2.939904	2.817590	42.320780
.6	.094886	.489874	.361182	5.603212	.521434	2.203766	2.105044	31.270160
.7	.088046	.430392	.311040	4.663794	.400908	1.660992	1.580346	23.191060
.8	.081888	.379142	.268382	3.891352	.310704	1.259036	1.192378	17.264780
.9	.076336	.334842	.232002	3.254132	.242808	.959984	.904280	12.902720
1.0	.071320	.296432	.200900	2.726862	.191392	.736424	.689388	9.680622
1.1	.066778	.263026	.174254	2.289342	.152212	.568452	.528362	7.291950
1.2	.062660	.233892	.151376	1.925360	.122160	.441592	.407126	5.514558
1.3	.058916	.208412	.131694	1.621838	.098948	.345262	.315402	4.187044
1.4	.055508	.186072	.114728	1.368176	.080898	.271708	.245664	3.191728
1.5	.052400	.166436	.100080	1.155754	.066756	.215224	.192370	2.442602
1.6	.049560	.149134	.087410	.977540	.055596	.171600	.151438	1.876588
1.7	.046958	.133856	.076432	.827768	.046724	.137706	.119838	1.447262
1.8	.044574	.120336	.066908	.701700	.039616	.111216	.095316	1.120350
1.9	.042382	.108346	.058632	.595430	.033880	.090390	.076190	.870466
2.0	.040364	.097692	.051432	.505726	.029216	.073918	.061198	.678734
2.2	.036786	.079748	.039684	.365762	.022240	.050322	.040036	.416920
2.4	.033722	.065432	.030726	.265348	.017424	.035040	.026650	.259428
2.6	.031082	.053934	.023866	.193024	.014006	.024916	.018026	.163368
2.8	.028794	.044646	.018590	.140754	.011516	.018060	.012370	.104010
3.0	.026796	.037102	.014518	.102864	.009660	.013324	.008604	.066884
3.5	.022790	.023714	.007906	.047352	.006678	.006654	.003648	.023040
4.0	.019804	.015442	.004360	.022016	.004988	.003588	.001642	.008304
4.5	.017512	.010212	.002430	.010320	.003936	.002054	.000774	.003102
5.0	.015706	.006844	.001366	.004872	.003234	.001228	.000378	.001194
6.0	.013060	.003170	.000442	.001104	.002374	.000484	.000100	.000190
7.0	.011222	.001518	.000146	.000256	.001882	.000208	.000028	.000032
8.0	.009878	.000744	.000050	.000060	.001568	.000094	.000008	.000006
9.0	.008854	.000372	.000018	.000014	.001354	.000044	.000002	.000002
10.0	.008048	.000188	.000006	.000004	.001202	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.567946	2.662622	4.085690	5.101944	1.034208	5.333466	5.359478	44.456940
.2	1.476188	2.360278	3.542974	4.226740	.795202	4.023028	4.036166	33.117600
.3	1.392860	2.098380	3.078744	3.513904	.615728	3.050358	3.054272	24.766000
.4	1.317026	1.870666	2.680584	2.930650	.480216	2.325206	2.322586	18.593060
.5	1.247868	1.671968	2.338200	2.451378	.377316	1.782112	1.774962	14.013750
.6	1.184666	1.497990	2.043056	2.055984	.298718	1.373440	1.363250	10.604110
.7	1.126790	1.345166	1.788048	1.728590	.238318	1.064426	1.052284	8.055760
.8	1.073678	1.210504	1.567238	1.456580	.191612	.829600	.816316	6.143866
.9	1.024836	1.091498	1.375642	1.229878	.155268	.650250	.636406	4.703950
1.0	.979838	.986032	1.209074	1.040402	.126802	.512558	.498578	3.615298
1.1	.938294	.892322	1.064000	.881616	.104362	.406298	.392484	2.789060
1.2	.899866	.808848	.937432	.748232	.086558	.323866	.310424	2.159564
1.3	.864254	.734320	.826826	.635936	.072338	.259582	.246652	1.678142
1.4	.831186	.667626	.730026	.541206	.060906	.209186	.196858	1.308580
1.5	.800426	.607820	.645186	.461142	.051656	.169470	.157798	1.023838
1.6	.771762	.554084	.570728	.393360	.044124	.138010	.127018	.803658
1.7	.745004	.505710	.505298	.335888	.037954	.112960	.102654	.632802
1.8	.719982	.462088	.447736	.287084	.032864	.092916	.083286	.499762
1.9	.696544	.422684	.397036	.245588	.028644	.076796	.067824	.395828
2.0	.674554	.387034	.352334	.210260	.025120	.063770	.055430	.314370
2.2	.634442	.325424	.278026	.154466	.019670	.044566	.037398	.199832
2.4	.598810	.274570	.219936	.113778	.015746	.031680	.025548	.128240
2.6	.566974	.232388	.174374	.084004	.012862	.022880	.017656	.083008
2.8	.538376	.197240	.138532	.062150	.010700	.016774	.012328	.054148
3.0	.512558	.167838	.110260	.046066	.009050	.012468	.008692	.035572
3.5	.457832	.113202	.062762	.021938	.006332	.006274	.003766	.012780
4.0	.413838	.077252	.036034	.010534	.004752	.003376	.001708	.004738
4.5	.377682	.053224	.020838	.005090	.003758	.001920	.000806	.001804
5.0	.347408	.036962	.012122	.002474	.003094	.001142	.000392	.000702
6.0	.299476	.018164	.004164	.000592	.002278	.000446	.000102	.000112
7.0	.263124	.009100	.001452	.000144	.001812	.000190	.000028	.000020
8.0	.234532	.004626	.000512	.000036	.001514	.000086	.000008	.000004
9.0	.211410	.002378	.000182	.000008	.001314	.000040	.000002	.000000
10.0	.192308	.001234	.000066	.000002	.001170	.000020	.000000	.000000

TABLE 12 K. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 50 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.141088	.953008	.761414	14.041590	2.219178	10.357470	10.030770	159.845300
.2	.129652	.827248	.649928	11.532200	1.650322	7.621682	7.368990	116.614000
.3	.119432	.720508	.556184	9.506454	1.234600	5.634130	5.436356	85.363780
.4	.110280	.629556	.477110	7.863362	.929500	4.184974	4.028290	62.708280
.5	.102070	.551762	.410212	6.524690	.704562	3.124336	2.998684	46.233600
.6	.094690	.484978	.353452	5.429536	.537918	2.344922	2.242928	34.215080
.7	.088044	.427442	.305164	4.530128	.413824	1.769722	1.685950	25.418400
.8	.082048	.377708	.263974	3.788834	.320910	1.343332	1.273750	18.957760
.9	.076628	.334578	.228754	3.175856	.250940	1.025762	.967354	14.195910
1.0	.071720	.297056	.198566	2.667438	.197926	.788076	.738570	10.673300
1.1	.067266	.264320	.172638	2.244564	.157504	.609272	.566932	8.057680
1.2	.063216	.235680	.150318	1.891938	.126480	.474046	.437548	6.108062
1.3	.059528	.210552	.131068	1.597192	.102504	.371218	.339530	4.649208
1.4	.056164	.188454	.114434	1.350296	.083844	.292586	.264900	3.553254
1.5	.053088	.168970	.100038	1.143072	.069218	.232112	.207786	2.726644
1.6	.050272	.151754	.087554	.968826	.057666	.185328	.163850	2.100692
1.7	.047688	.136506	.076714	.822062	.048474	.148922	.129878	1.624786
1.8	.045314	.122976	.067286	.698256	.041106	.120422	.103474	1.261522
1.9	.043130	.110944	.059076	.593666	.035156	.097978	.082844	.983132
2.0	.041114	.100226	.051916	.505194	.030314	.080198	.066646	.768958
2.2	.037530	.082108	.040202	.366736	.023068	.054674	.043724	.475330
2.4	.034452	.067582	.031230	.267004	.018060	.038096	.029180	.297670
2.6	.031792	.055868	.024332	.194894	.014504	.027088	.019778	.188654
2.8	.029480	.046366	.019008	.142582	.011912	.019620	.013596	.120872
3.0	.027456	.038620	.014884	.104526	.009978	.014454	.009466	.078212
3.5	.023386	.024802	.008154	.048470	.006878	.007178	.004018	.027340
4.0	.020338	.016208	.004520	.022682	.005124	.003844	.001804	.009982
4.5	.017994	.010746	.002530	.010696	.004036	.002182	.000848	.003772
5.0	.016142	.007214	.001428	.005076	.003312	.001296	.000412	.001466
6.0	.013426	.003350	.000464	.001162	.002430	.000506	.000106	.000236
7.0	.011538	.001606	.000154	.000270	.001924	.000216	.000030	.000040
8.0	.010154	.000788	.000052	.000064	.001604	.000098	.000008	.000008
9.0	.009100	.000394	.000018	.000016	.001386	.000046	.000002	.000002
10.0	.008270	.000200	.000006	.000004	.001230	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.537728	2.574406	3.921790	4.852578	1.049290	5.488230	5.497190	46.330180
.2	1.450152	2.287380	3.406778	4.027058	.807848	4.149400	4.149648	34.588320
.3	1.370470	2.038166	2.965468	3.353590	.626400	3.154088	3.148054	25.926900
.4	1.297820	1.820970	2.586286	2.801628	.489274	2.410744	2.400298	19.514080
.5	1.231446	1.630998	2.259642	2.347314	.385040	1.852946	1.839518	14.747980
.6	1.170678	1.464280	1.977570	1.971880	.305334	1.432318	1.416992	11.191990
.7	1.114928	1.317490	1.733430	1.660496	.244006	1.113530	1.097122	8.528392
.8	1.063678	1.187848	1.521668	1.401362	.196520	.870680	.853796	6.525256
.9	1.016472	1.073022	1.337610	1.185040	.159514	.684708	.667790	5.012778
1.0	.972908	.971040	1.177330	1.003942	.130488	.541534	.524902	3.866166
1.1	.932622	.880228	1.037502	.851942	.107568	.430720	.414596	2.993422
1.2	.895300	.799168	.915314	.724056	.089354	.344488	.329024	2.326482
1.3	.860658	.726646	.808372	.616228	.074780	.277028	.262320	1.814800
1.4	.828448	.661622	.714634	.525128	.063046	.223970	.210070	1.420702
1.5	.798442	.603202	.632356	.448020	.053534	.182018	.168952	1.116012
1.6	.770442	.550614	.560042	.382646	.045774	.148674	.136444	.879568
1.7	.744270	.503188	.496406	.327138	.039406	.122036	.110630	.695418
1.8	.719764	.460348	.440344	.279938	.034146	.100650	.090038	.551490
1.9	.696782	.421588	.390900	.239752	.029776	.083394	.073546	.438618
2.0	.675196	.386462	.347250	.205498	.026124	.069406	.060282	.349810
2.2	.635762	.325626	.274556	.151294	.020462	.048690	.040896	.224224
2.4	.600658	.275268	.217592	.111672	.016376	.034710	.028078	.145090
2.6	.569240	.233386	.172814	.082610	.013366	.025114	.019488	.094686
2.8	.540972	.198406	.137516	.061232	.011108	.018428	.013660	.062264
3.0	.515414	.169080	.109618	.045466	.009384	.013696	.009662	.041226
3.5	.461122	.114408	.062608	.021740	.006542	.006868	.004208	.015088
4.0	.417368	.078282	.036052	.010476	.004894	.003670	.001912	.005692
4.5	.381336	.054054	.020900	.005080	.003862	.002070	.000900	.002200
5.0	.351120	.037610	.012186	.002476	.003172	.001220	.000438	.000866
6.0	.303194	.018540	.004200	.000596	.002332	.000470	.000112	.000142
7.0	.266774	.009312	.001470	.000144	.001852	.000198	.000030	.000024
8.0	.238080	.004744	.000520	.000036	.001550	.000090	.000010	.000004
9.0	.214844	.002444	.000186	.000008	.001344	.000042	.000002	.000000
10.0	.195622	.001270	.000066	.000002	.001196	.000020	.000000	.000000

TABLE 12 L CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 55 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.138938	.929290	.735914	13.559890	2.271176	10.868060	10.536330	171.323800
.2	.127952	.809000	.629598	11.155460	1.689590	8.003018	7.745554	125.092200
.3	.118112	.706642	.540008	9.211734	1.264480	5.920614	5.718382	91.654640
.4	.109284	.619192	.464274	7.632846	.952414	4.401542	4.240744	67.398140
.5	.101346	.544194	.400058	6.344514	.722276	3.289100	3.159672	49.746720
.6	.094198	.479636	.345456	5.288846	.551728	2.471094	2.365656	36.859840
.7	.087746	.423866	.298898	4.420452	.424682	1.866986	1.780092	27.419500
.8	.081914	.375524	.259100	3.703542	.329518	1.418808	1.346408	20.479480
.9	.076630	.333484	.224992	3.109716	.257822	1.084724	1.023780	15.359020
1.0	.071834	.296816	.195696	2.616352	.203474	.834442	.782658	11.566850
1.1	.067474	.264736	.170478	2.205294	.162014	.645966	.601590	8.747590
1.2	.063504	.236592	.148724	1.861934	.130174	.503272	.464952	6.643392
1.3	.059880	.211836	.129924	1.574450	.105554	.394636	.361322	5.066590
1.4	.056568	.190008	.113644	1.333226	.086380	.311460	.282324	3.880214
1.5	.053534	.170714	.099524	1.130418	.071340	.247406	.221790	2.983944
1.6	.050750	.153622	.087256	.959602	.059454	.197786	.175162	2.304054
1.7	.048192	.138448	.076584	.815488	.049990	.159122	.139058	1.786188
1.8	.045838	.124950	.067282	.693720	.042400	.128810	.110956	1.390124
1.9	.043666	.112922	.059168	.590688	.036264	.104908	.088970	1.085992
2.0	.041662	.102180	.052078	.503394	.031270	.085946	.071678	.851518
2.2	.038086	.083963	.040446	.366470	.023788	.058668	.047158	.529042
2.4	.035008	.069308	.031510	.267540	.018612	.040910	.031550	.333026
2.6	.032340	.057440	.024614	.195802	.014934	.029090	.021432	.212164
2.8	.030016	.047780	.019276	.143612	.012252	.021058	.014762	.136644
3.0	.027978	.039880	.015132	.105538	.010252	.015496	.010294	.088872
3.5	.023862	.025722	.008334	.049220	.007046	.007658	.004378	.031452
4.0	.020772	.016864	.004640	.023154	.005234	.004072	.001966	.011614
4.5	.018386	.011208	.002606	.010970	.004116	.002294	.000922	.004432
5.0	.016500	.007538	.001476	.005228	.003372	.001354	.000448	.001736
6.0	.013724	.003508	.000482	.001206	.002470	.000522	.000114	.000284
7.0	.011796	.001684	.000162	.000282	.001956	.000220	.000032	.000050
8.0	.010382	.000826	.000054	.000066	.001630	.000100	.000010	.000010
9.0	.009302	.000414	.000018	.000016	.001408	.000046	.000002	.000002
10.0	.008454	.000210	.000006	.000004	.001248	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.506226	2.495468	3.771000	4.669576	1.058314	5.603726	5.594326	47.993340
.2	1.422496	2.221530	3.280714	3.879052	.815906	4.246248	4.232254	35.886940
.3	1.346198	1.983220	2.859936	3.233610	.633562	3.235434	3.218186	26.947240
.4	1.276520	1.775116	2.497822	2.704166	.495622	2.479192	2.459782	20.320400
.5	1.212758	1.592746	2.185398	2.267990	.390654	1.910632	1.889938	15.388740
.6	1.154292	1.432382	1.915196	1.907208	.310292	1.481020	1.459720	11.703800
.7	1.100572	1.290920	1.680974	1.607684	.248380	1.154712	1.133334	8.939156
.8	1.051114	1.165746	1.477516	1.358176	.200378	.905554	.884488	6.856404
.9	1.005492	1.054668	1.300416	1.149682	.162916	.714284	.693812	5.280816
1.0	.963326	.955834	1.145978	.974962	.133486	.566650	.546978	4.083926
1.1	.924280	.867668	1.011058	.828164	.110214	.452078	.433332	3.170932
1.2	.888058	.788834	.893000	.704530	.091688	.362674	.344936	2.471622
1.3	.854394	.718180	.789534	.600182	.076842	.292530	.275838	1.933804
1.4	.823050	.654726	.698728	.511932	.064866	.237198	.221566	1.518522
1.5	.793814	.597626	.618918	.437164	.055144	.[illegible]718	.178732	1.196600
1.6	.766502	.546146	.548690	.373714	.047200	.158338	.144770	.946096
1.7	.740942	.499652	.486818	.319784	.040668	.130308	.117722	.750440
1.8	.716984	.457590	.432244	.273882	.035266	.107736	.096084	.597074
1.9	.694492	.419480	.384060	.234764	.030770	.089470	.078702	.476438
2.0	.673344	.384900	.341472	.201390	.027008	.074620	.064682	.381232
2.2	.634652	.324892	.270442	.148508	.021162	.052538	.044106	.245992
2.4	.600150	.275098	.214670	.109786	.016936	.037558	.030424	.160232
2.6	.569220	.233594	.170748	.081336	.013816	.027230	.021206	.105256
2.8	.541350	.198860	.136060	.060372	.011472	.020002	.014920	.069666
3.0	.516118	.169682	.108600	.044888	.009680	.014872	.010588	.046420
3.5	.462416	.115134	.062210	.021532	.006728	.007438	.004640	.017252
4.0	.419036	.078960	.035914	.010406	.005016	.003952	.002116	.006600
4.5	.383248	.054626	.020866	.005058	.003948	.002210	.000996	.002584
5.0	.353194	.038070	.012188	.002470	.003238	.001292	.000484	.001032
6.0	.305448	.018816	.004214	.000596	.002376	.000490	.000122	.000172
7.0	.269104	.009470	.001478	.000146	.001886	.000204	.000034	.000030
8.0	.240432	.004832	.000524	.000036	.001576	.000092	.000010	.000006
9.0	.217182	.002492	.000188	.000008	.001366	.000042	.000002	.000002
10.0	.197928	.001296	.000068	.000002	.001216	.000020	.000000	.000000

TABLE 12 M. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 60 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.138030	.908778	.717840	13.089160	2.319634	11.313220	10.989120	181.476000
.2	.127316	.793036	.615180	10.788370	1.725790	8.335316	8.082044	132.590700
.3	.117706	.694340	.528550	8.924976	1.291710	6.170176	5.969836	97.218480
.4	.109072	.609840	.455192	7.408532	.973040	4.590140	4.429718	71.546140
.5	.101298	.537210	.392892	6.168898	.738016	3.432556	3.302532	52.854380
.6	.094284	.474550	.339830	5.151278	.563832	2.580940	2.474316	39.199820
.7	.087946	.420298	.294512	4.312690	.434062	1.951672	1.863252	29.190460
.8	.082208	.373166	.255706	3.619158	.336846	1.484542	1.410452	21.826740
.9	.077002	.332085	.222398	3.043698	.263592	1.136092	1.073410	16.389270
1.0	.072270	.296172	.193740	2.564778	.208054	.874858	.821360	12.358780
1.1	.067960	.264684	.169030	2.165096	.165676	.677976	.631960	9.359462
1.2	.064030	.236998	.147680	1.830688	.133122	.528786	.488924	7.118536
1.3	.060436	.212592	.129198	1.550254	.107944	.415098	.380356	5.437396
1.4	.057148	.191024	.113172	1.314574	.088332	.327968	.297524	4.170988
1.5	.054132	.171922	.099248	1.116130	.072942	.260798	.233992	3.213010
1.6	.051362	.154964	.087132	.948740	.060778	.208710	.185010	2.485326
1.7	.048810	.139878	.076576	.807310	.051090	.168076	.147044	1.930248
1.8	.046460	.126434	.067364	.687638	.043316	.136184	.117460	1.505080
1.9	.044290	.114428	.059314	.586238	.037032	.111006	.094290	1.178074
2.0	.042282	.103690	.052270	.500212	.031914	.091008	.076048	.925550
2.2	.038698	.085432	.040692	.365012	.024248	.062196	.050138	.577374
2.4	.035604	.070684	.031772	.267080	.018944	.043396	.033608	.364960
2.6	.032918	.058708	.024872	.195888	.015174	.030862	.022868	.233484
2.8	.030572	.048932	.019518	.143976	.012428	.022332	.015772	.151006
3.0	.028510	.040916	.015348	.106018	.010380	.016418	.011012	.098622
3.5	.024340	.026488	.008490	.049676	.007104	.008078	.004690	.035256
4.0	.021198	.017416	.004744	.023470	.005260	.004268	.002106	.013142
4.5	.018766	.011602	.002674	.011164	.004126	.002388	.000986	.005060
5.0	.016842	.007816	.001518	.005340	.003376	.001398	.000476	.001998
6.0	.014008	.003646	.000498	.001238	.002470	.000532	.000120	.000330
7.0	.012034	.001750	.000166	.000292	.001956	.000224	.000034	.000058
8.0	.010588	.000860	.000056	.000070	.001630	.000100	.000010	.000010
9.0	.009486	.000430	.000020	.000016	.001410	.000046	.000002	.000002
10.0	.008618	.000218	.000006	.000004	.001252	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.490188	2.428048	3.663772	4.484442	1.069348	5.695668	5.685608	49.378780
.2	1.408810	2.164928	3.190994	3.730436	.825228	4.324238	4.308786	36.969660
.3	1.334568	1.935666	2.784760	3.113906	.641466	3.301616	3.282400	27.798720
.4	1.266702	1.735150	2.434770	2.607450	.502348	2.535390	2.513726	20.994140
.5	1.204530	1.559144	2.132462	2.189624	.396396	1.958390	1.935304	15.924830
.6	1.147458	1.404134	1.870716	1.843548	.315208	1.521638	1.497922	12.132700
.7	1.094964	1.267178	1.643572	1.555844	.252602	1.189292	1.165538	9.283960
.8	1.046586	1.145804	1.446040	1.315866	.204010	.935024	.911674	7.134904
.9	1.001910	1.037934	1.273916	1.115084	.166048	.739424	.716790	5.506690
1.0	.960576	.941810	1.123658	.946616	.136194	.588120	.566420	4.267828
1.1	.922266	.855934	.992256	.804904	.112558	.470430	.449802	3.321188
1.2	.886688	.779036	.877154	.685418	.093718	.378376	.358906	2.594780
1.3	.853590	.710022	.776180	.584454	.078604	.305978	.287700	2.035038
1.4	.822746	.647958	.687470	.498976	.066398	.248726	.231646	1.601950
1.5	.793950	.592034	.609434	.426480	.056476	.203208	.187310	1.265518
1.6	.767024	.541548	.540700	.364892	.048360	.166830	.152074	1.003146
1.7	.741804	.495894	.480088	.312496	.041680	.137606	.123946	.797756
1.8	.718144	.454546	.426582	.267858	.036148	.114012	.101394	.636382
1.9	.695914	.417036	.379296	.229782	.031538	.094872	.083236	.509148
2.0	.674998	.382964	.337470	.197264	.027678	.079270	.068556	.408486
2.2	.636684	.323742	.267624	.145680	.021672	.055994	.046938	.264986
2.4	.602474	.274502	.212698	.107844	.017322	.040132	.032502	.173526
2.6	.571766	.233384	.169376	.080002	.014112	.029150	.022732	.114592
2.8	.544066	.198912	.135116	.059456	.011696	.021436	.016044	.076242
3.0	.518962	.169910	.107958	.044260	.009850	.015946	.011416	.051064
3.5	.465448	.115558	.061988	.021290	.006810	.007962	.005030	.019214
4.0	.422144	.079404	.035858	.010314	.005054	.004210	.002300	.007438
4.5	.386368	.055024	.020870	.005024	.003964	.002338	.001084	.002944
5.0	.356294	.038398	.012210	.002458	.003242	.001354	.000526	.001186
6.0	.308458	.019020	.004234	.000596	.002372	.000504	.000132	.000202
7.0	.272004	.009590	.001488	.000146	.001884	.000208	.000036	.000036
8.0	.243216	.004900	.000528	.000036	.001576	.000092	.000010	.000006
9.0	.219856	.002530	.000190	.000008	.001366	.000044	.000004	.000002
10.0	.200496	.001318	.000068	.000002	.001218	.000020	.000000	.000000

TABLE 12 N. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 65 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.136570	.895780	.703400	12.760620	2.358282	11.693140	11.365[illegible]	190.113300
.2	.126172	.782978	.603562	10.529910	1.754642	8.618380	8.361354	138.968000
.3	.116830	.686660	.519204	8.721262	1.313388	6.382344	6.178464	101.948900
.4	.108424	.604080	.447698	7.247726	.989444	4.750180	4.586464	75.071820
.5	.100844	.532996	.386900	6.041808	.750522	3.554060	3.421016	55.495280
.6	.093994	.471582	.335056	5.050778	.573434	2.673812	2.564430	41.188060
.7	.087794	.418326	.290726	4.233180	.441490	2.023148	1 932226	30.695080
.8	.082170	.371990	.252722	3.556270	.342636	1.539932	1.463588	22.971420
.9	.077062	.331542	.220062	2.993988	.268136	1.179318	1.114612	17.264720
1.0	.072410	.296124	.191928	2.525518	.211646	.908822	.853512	13.031870
1.1	.068168	.265022	.167642	2.134132	.168534	.704842	.657208	9.879686
1.2	.064294	.237632	.146632	1.806324	.135412	.550176	.508876	7.522688
1.3	.060748	.213452	.128424	1.531132	.109788	.432240	.396218	5.752970
1.4	.057496	.192050	.112616	1.299626	.089824	.341786	.310206	4.418614
1.5	.054508	.173066	.098866	1.104490	.074156	.272004	.244192	3.408252
1.6	.051762	.156188	.086888	.939724	.061768	.217844	.193254	2.639966
1.7	.049230	.141152	.076438	.800376	.051900	.175558	.153740	2.053266
1.8	.046892	.127732	.067310	.682350	.043980	.142344	.122926	1.603356
1.9	.044732	.115732	.059324	.582248	.037578	.116098	.098770	1.256892
2.0	.042730	.104982	.052330	.497242	.032362	.095234	.079736	.988996
2.2	.039152	.086670	.040814	.363466	.024548	.065138	.052664	.618916
2.4	.036054	.071844	.031922	.266388	.019142	.045470	.035360	.392494
2.6	.033360	.059772	.025032	.195692	.015302	.032338	.024098	.251928
2.8	.031002	.049898	.019674	.144054	.012504	.023390	.016642	.163476
3.0	.028928	.041782	.015496	.106236	.010420	.017180	.011630	.107120
3.5	.024720	.027132	.008600	.049954	.007094	.008422	.004964	.038606
4.0	.021538	.017882	.004820	.023678	.005230	.004426	.002230	.014502
4.5	.019072	.011934	.002724	.011296	.004090	.002458	.001042	.005622
5.0	.017116	.008050	.001550	.005418	.003338	.001430	.000504	.002234
6.0	.014234	.003762	.000510	.001262	.002438	.000538	.000126	.000374
7.0	.012224	.001808	.000172	.000298	.001930	.000224	.000034	.000066
8.0	.010754	.000888	.000058	.000072	.001610	.000100	.000010	.000012
9.0	.009630	.000444	.000020	.000018	.001392	.000046	.000004	.000002
10.0	.008748	.000226	.000008	.000004	.001238	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.468542	2.384358	3.578914	4.356894	1.075928	5.777956	5.755130	50.411040
.2	1.389840	2.128208	3.119534	3.627366	.831090	4.393088	4.367488	37.786860
.3	1.317958	1.904800	2.724512	3.030350	.646666	3.359388	3.332000	28.448900
.4	1.252168	1.709204	2.383910	2.539510	.506940	2.584000	2.555660	21.513960
.5	1.191828	1.537352	2.089486	2.134226	.400444	1.999402	1.970782	16.342370
.6	1.136374	1.385838	1.834364	1.798262	.318768	1.556322	1.527966	12.469500
.7	1.085308	1.251838	1.612796	1.518742	.255728	1.218692	1.191008	9.556792
.8	1.038192	1.132958	1.419966	1.285406	.206752	.959996	.933288	7.356724
.9	.994636	1.027200	1.251814	1.090026	.168452	.760676	.735150	5.687696
1.0	.954294	.932862	1.104908	.925972	.138298	.606240	.582032	4.415994
1.1	.916860	.848500	.976340	.787868	.114398	.485904	.463092	3.442840
1.2	.882060	.772882	.863642	.671338	.095328	.391612	.370228	2.694938
1.3	.849654	.704954	.764702	.572804	.080012	.317316	.297356	2.117708
1.4	.819424	.643806	.677722	.489328	.067626	.258450	.239890	1.670342
1.5	.791176	.588658	.601152	.418480	.057548	.211558	.194352	1.322216
1.6	.764736	.538828	.533662	.358256	.049296	.174008	.158096	1.050240
1.7	.739950	.493730	.474108	.306984	.042494	.143782	.129100	.836940
1.8	.716678	.452848	.421500	.263278	.036856	.119330	.105806	.669038
1.9	.694794	.415732	.374980	.225972	.032156	.099456	.087016	.536400
2.0	.674186	.381988	.333804	.194096	.028214	.083224	.071798	.431260
2.2	.636396	.323274	.264984	.143486	.022074	.058942	.049328	.280946
2.4	.602608	.274386	.210800	.106322	.017622	.042334	.034266	.184754
2.6	.572238	.233506	.168016	.078946	.014330	.030798	.024038	.122520
2.8	.544808	.199188	.134146	.058724	.011856	.022672	.017012	.081854
3.0	.519926	.170282	.107272	.043752	.009962	.016874	.012134	.055048
3.5	.466800	.116016	.061708	.021086	.006850	.008416	.005372	.020920
4.0	.423726	.079834	.035754	.010234	.005058	.004432	.002464	.008176
4.5	.388092	.055390	.020840	.004994	.003950	.002446	.001164	.003266
5.0	.358102	.038694	.012208	.002448	.003220	.001408	.000564	.001328
6.0	.310340	.019200	.004242	.000594	.002350	.000516	.000140	.000228
7.0	.273898	.009692	.001492	.000146	.001862	.000210	.000038	.000042
8.0	.245092	.004958	.000530	.000036	.001558	.000092	.000010	.000008
9.0	.221698	.002562	.000190	.000010	.001354	.000044	.000004	.000002
10.0	.202294	.001336	.000068	.000002	.001208	.000020	.000000	.000000

TABLE 12 O. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 70 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.135268	.882330	.690526	12.489040	2.386712	12.000840	11.677080	197.226000
.2	.125128	.772338	.593164	10.314530	1.775756	8.847642	8.592822	144.220700
.3	.116008	.678304	.510816	8.550188	1.329172	6.554214	6.351172	105.846300
.4	.107792	.597582	.440940	7.111696	1.001322	4.879848	4.716076	77.977640
.5	.100372	.528008	.381466	5.933532	.759522	3.652546	3.518878	57.672660
.6	.093660	.467818	.330698	4.964532	.580302	2.749128	2.638782	42.827940
.7	.087578	.415554	.287242	4.164464	.446768	2.081144	1.989076	31.936620
.8	.082054	.370018	.249948	3.501514	.346718	1.584910	1.507336	23.916360
.9	.077028	.330216	.217864	2.950362	.271314	1.214446	1.148496	17.987760
1.0	.072448	.295314	.190198	2.490786	.214136	.936450	.879928	13.588050
1.1	.068266	.264624	.166292	2.106512	.170496	.726720	.677934	10.309790
1.2	.064440	.237562	.145588	1.784384	.136964	.567618	.525240	7.857032
1.3	.060934	.213636	.127628	1.513736	.111022	.446232	.409218	6.014194
1.4	.057718	.192434	.112018	1.285862	.090808	.353082	.320594	4.623730
1.5	.054758	.173600	.098428	1.093636	.074940	.281174	.252538	3.570084
1.6	.052032	.156834	.086578	.931192	.062394	.225330	.199996	2.768238
1.7	.049518	.141880	.076230	.793698	.052400	.181700	.159216	2.155388
1.8	.047196	.128516	.067182	.677150	.044378	.147406	.127394	1.684998
1.9	.045046	.116552	.059258	.578226	.037892	.120288	.102432	1.322422
2.0	.043052	.105822	.052314	.494154	.032610	.098716	.082748	1.041792
2.2	.039482	.087514	.040862	.361702	.024694	.067568	.054726	.653542
2.4	.036386	.072656	.032006	.265446	.019220	.047186	.036790	.415488
2.6	.033688	.060536	.025132	.195252	.015332	.033560	.025100	.267362
2.8	.031324	.050602	.019780	.143906	.012502	.024268	.017352	.173930
3.0	.029240	.042424	.015598	.106252	.010398	.017814	.012136	.114260
3.5	.025004	.027620	.008682	.050104	.007042	.008706	.005186	.041434
4.0	.021794	.018240	.004878	.023810	.005170	.004552	.002330	.015656
4.5	.019300	.012192	.002762	.011386	.004030	.002516	.001088	.006104
5.0	.017320	.008234	.001574	.005474	.003284	.001454	.000524	.002438
6.0	.014400	.003854	.000520	.001280	.002392	.000540	.000132	.000412
7.0	.012364	.001854	.000176	.000304	.001894	.000222	.000036	.000074
8.0	.010870	.000912	.000060	.000072	.001582	.000098	.000010	.000014
9.0	.009734	.000456	.000020	.000018	.001370	.000046	.000004	.000002
10.0	.008838	.000232	.000008	.000004	.001218	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

multiply by 10^{-3}

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.449662	2.340992	3.504144	4.253658	1.079948	5.836002	5.609268	51.178320
.2	1.373136	2.091464	3.056542	3.543488	.834814	4.442638	4.413430	38.399440
.3	1.303180	1.873632	2.671360	2.961990	.650068	3.401712	3.370984	28.940160
.4	1.239092	1.682750	2.339006	2.483654	.510018	2.620168	2.588750	21.909500
.5	1.180260	1.514880	2.051496	2.088474	.403206	2.030338	1.998890	16.662090
.6	1.126142	1.366744	1.802186	1.760700	.321234	1.582804	1.551858	12.728920
.7	1.076262	1.235608	1.585514	1.487838	.257916	1.241388	1.211328	9.768004
.8	1.030202	1.119166	1.396812	1.259936	.208688	.979464	.950584	7.529254
.9	.987580	1.015478	1.232144	1.068994	.170160	.777392	.749886	5.829052
1.0	.948072	.922906	1.088184	.908578	.139800	.620606	.594596	4.532160
1.1	.911380	.840050	.962114	.773464	.115716	.498262	.473814	3.538548
1.2	.877242	.765718	.851530	.659394	.096482	.402252	.379386	2.773980
1.3	.845426	.698886	.754386	.562888	.081018	.326482	.305186	2.183136
1.4	.815724	.638678	.668930	.481086	.068504	.266354	.246588	1.724614
1.5	.787948	.584330	.593656	.411622	.058312	.218380	.200086	1.367318
1.6	.761932	.535186	.527270	.352546	.049956	.179898	.163010	1.087786
1.7	.737522	.490674	.468656	.302226	.043066	.148872	.133312	.868250
1.8	.714590	.450294	.416850	.259310	.037350	.123732	.109422	.695182
1.9	.693012	.413606	.371012	.222662	.032578	.103264	.090120	.558260
2.0	.672676	.380230	.330418	.191334	.028576	.086520	.074464	.449564
2.2	.635356	.322094	.262522	.141556	.022334	.061416	.051298	.293816
2.4	.601946	.273628	.209010	.104974	.017804	.044192	.035724	.193842
2.6	.571884	.233052	.166716	.078002	.014454	.032196	.025120	.128956
2.8	.544710	.198952	.133206	.058064	.011934	.023724	.017816	.086426
3.0	.520034	.170200	.106592	.043288	.010006	.017666	.012734	.058302
3.5	.467286	.116138	.061414	.020896	.006840	.008806	.005660	.022324
4.0	.424452	.080022	.035632	.010156	.005024	.004624	.002602	.008786
4.5	.388972	.055580	.020794	.004962	.003906	.002540	.001230	.003534
5.0	.359084	.038862	.012194	.002436	.003176	.001452	.000596	.001446
6.0	.311442	.019310	.004244	.000592	.002310	.000526	.000148	.000252
7.0	.275056	.009760	.001496	.000146	.001830	.000212	.000040	.000046
8.0	.246272	.004998	.000532	.000036	.001532	.000092	.000012	.000008
9.0	.222882	.002584	.000192	.000010	.001332	.000042	.000004	.000002
10.0	.203472	.001348	.000070	.000002	.001190	.000020	.000002	.000000

TABLE 12 P. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 75 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.134808	.871366	.680132	12.243280	2.409672	12.238880	11.918990	202.919200
.2	.124804	.763716	.584752	10.120730	1.792550	9.024674	8.772144	148.422600
.3	.115802	.671570	.504012	8.397010	1.341510	6.686674	6.484850	108.961900
.4	.107684	.592372	.435440	6.990350	1.010428	4.979570	4.816318	80.299020
.5	.100348	.524028	.377026	5.837254	.766272	3.728122	3.594484	59.411020
.6	.093708	.464828	.327120	4.888028	.585328	2.806786	2.696176	44.136340
.7	.087684	.413362	.284366	4.103600	.450524	2.125438	2.032922	32.926640
.8	.082208	.368466	.247644	3.453046	.349534	1.619180	1.541048	24.669480
.9	.077224	.329176	.216024	2.911752	.273432	1.241140	1.174588	18.563710
1.0	.072676	.294684	.188736	2.460016	.215728	.957388	.900254	14.030910
1.1	.068522	.264318	.165136	2.081994	.171694	.743258	.693872	10.652130
1.2	.064718	.237512	.144684	1.764858	.137862	.580764	.537816	8.123062
1.3	.061230	.213788	.126924	1.498198	.111692	.456750	.419202	6.221998
1.4	.058024	.192738	.111478	1.273514	.091300	.361546	.328568	4.786864
1.5	.055076	.174022	.098020	1.083836	.075298	.288026	.258944	3.698776
1.6	.052358	.157344	.086276	.923432	.062646	.230906	.205170	2.870234
1.7	.049848	.142454	.076014	.787572	.052568	.186260	.163414	2.236590
1.8	.047528	.129132	.067034	.672328	.044482	.151152	.130820	1.749918
1.9	.045378	.117196	.059164	.574446	.037946	.123378	.105238	1.374540
2.0	.043384	.106480	.052262	.491206	.032622	.101274	.085058	1.083790
2.2	.039808	.088172	.040870	.359946	.024650	.069340	.056306	.681102
2.4	.036704	.073292	.032048	.264438	.019140	.048424	.037888	.433800
2.6	.033996	.061134	.025190	.194708	.015230	.034432	.025870	.279664
2.8	.031620	.051152	.019844	.143648	.012388	.024886	.017896	.182272
3.0	.029524	.042926	.015664	.106162	.010274	.018254	.012524	.119962
3.5	.025256	.028002	.008738	.050172	.006918	.008892	.005356	.043700
4.0	.022016	.018522	.004918	.023892	.005056	.004630	.002406	.016584
4.5	.019496	.012396	.002790	.011448	.003926	.002544	.001124	.006492
5.0	.017494	.008380	.001594	.005512	.003190	.001462	.000540	.002604
6.0	.014536	.003926	.000528	.001294	.002320	.000538	.000134	.000442
7.0	.012476	.001890	.000178	.000308	.001836	.000220	.000036	.000080
8.0	.010964	.000930	.000060	.000074	.001534	.000096	.000010	.000014
9.0	.009814	.000466	*.000022*	*.000018*	*.001330*	.000044	.000004	.000002
10.0	.008908	.000236	.000008	.000004	.001186	.000022	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.441654	2.305582	3.444164	4.160634	1.085018	5.881736	5.849516	51.773920
.2	1.366296	2.061628	3.005984	3.468222	.839084	4.481538	4.447676	38.876900
.3	1.297364	1.848456	2.628676	2.900896	.653672	3.434828	3.400130	29.324400
.4	1.234178	1.661486	2.302914	2.433912	.513070	2.648400	2.613560	22.219880
.5	1.176144	1.496900	2.020934	2.047860	.405798	2.054428	2.020014	16.913720
.6	1.122730	1.351534	1.776270	1.727450	.323436	1.603388	1.569854	12.933620
.7	1.073472	1.222730	1.563512	1.460556	.259790	1.258990	1.226674	9.935070
.8	1.027958	1.108262	1.378112	1.237498	.210284	.994538	.963676	7.666012
.9	.985818	1.006248	1.216232	1.050510	.171518	.790314	.761064	5.941346
1.0	.946736	.915096	1.074634	.893318	.140956	.631696	.604148	4.624590
1.1	.910420	.833442	.950562	.760844	.116700	.507790	.481984	3.614824
1.2	.876614	.760136	.841678	.648942	.097316	.410446	.386378	2.837072
1.3	.845090	.694176	.745978	.554220	.081726	.333536	.311174	2.235432
1.4	.815646	.634708	.661748	.473888	.069100	.272430	.251720	1.768046
1.5	.788094	.580994	.587518	.405640	.058812	.223620	.204490	1.403458
1.6	.762278	.532390	.522022	.347566	.050374	.184418	.166790	1.117908
1.7	.738046	.488338	.464168	.298078	.043412	.152776	.136558	.893390
1.8	.715268	.448350	.413008	.255852	.037634	.127104	.112212	.716198
1.9	.693826	.411998	.367724	.219776	.032810	.106178	.092520	.575850
2.0	.673610	.378906	.327606	.188924	.028762	.089042	.076530	.464304
2.2	.636484	.321220	.260458	.139874	.022446	.063302	.052830	.304202
2.4	.603224	.273080	.207498	.103796	.017860	.045608	.036864	.201184
2.6	.573278	.232736	.165610	.077176	.014468	.033258	.025968	.134164
2.8	.546188	.198804	.132396	.057484	.011918	.024520	.018448	.090132
3.0	.521574	.170166	.106002	.042882	.009968	.018264	.013206	.060944
3.5	.468912	.116258	.061148	.020728	.006770	.009096	.005888	.023468
4.0	.426104	.080184	.035516	.010086	.004944	.004762	.002714	.009288
4.5	.390616	.055740	.020746	.004934	.003826	.002604	.001286	.003754
5.0	.360704	.039002	.012176	.002424	.003100	.001480	.000622	.001544
6.0	.312992	.019402	.004244	.000590	.002246	.000530	.000154	.000272
7.0	.276530	.009814	.001498	.000146	.001778	.000212	.000042	.000050
8.0	.247676	.005028	.000534	.000036	.001490	.000092	.000012	.000010
9.0	.224220	.002602	.000192	.000010	.001296	.000042	.000004	.000002
10.0	.4748	.001358	.000070	.000002	.001160	.000020	.000002	.000000

TABLE 12 Q. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 80 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.134180	.863922	.673880	12.096620	2.420576	12.407520	12.091400	206.959000
.2	.124302	.757752	.579682	10.003070	1.800412	9.149890	8.899528	151.405100
.3	.115406	.666822	.499904	8.302440	1.347196	6.780220	6.579496	111.174100
.4	.107380	.588620	.432118	6.914250	1.014548	5.049896	4.887016	81.947960
.5	.100122	.521094	.374344	5.775920	.769262	3.781340	3.647632	60.646280
.6	.093548	.462566	.324962	4.838556	.587500	2.847330	2.736364	45.066560
.7	.087580	.411648	.282634	4.063654	.452098	2.156540	2.063510	33.630820
.8	.082154	.367200	.246258	3.420774	.350672	1.643200	1.564478	25.205480
.9	.077210	.328274	.214924	2.885668	.274248	1.259826	1.192654	18.973910
1.0	.072696	.294080	.187868	2.438926	.216308	.972024	.914278	14.346520
1.1	.068570	.263952	.164454	2.064942	.172096	.754798	.704826	10.896270
1.2	.064790	.237338	.144156	1.751074	.138132	.589922	.546428	8.312946
1.3	.061320	.213766	.126520	1.487062	.111862	.464064	.426016	6.370446
1.4	.058132	.192838	.111174	1.264518	.091394	.367424	.333992	4.903512
1.5	.055196	.174216	.097796	1.076578	.075334	.292772	.263286	3.790896
1.6	.052488	.157610	.086118	.917584	.062640	.234762	.208666	2.943322
1.7	.049986	.142774	.075908	.782864	.052530	.189406	.166244	2.294850
1.8	.047672	.129494	.066968	.668548	.044418	.153730	.133120	1.796560
1.9	.045528	.117584	.059130	.571416	.037862	.125498	.107118	1.412026
2.0	.043538	.106886	.052254	.488784	.032524	.103026	.086600	1.114038
2.2	.039964	.088594	.040894	.358412	.024532	.070542	.057358	.701006
2.4	.036862	.073706	.032092	.263484	.019012	.049258	.038612	.447066
2.6	.034150	.061530	.025244	.194128	.015100	.035014	.026374	.288602
2.8	.031770	.051522	.019900	.143308	.012256	.025292	.018252	.188352
3.0	.029668	.043264	.015718	.105974	.010146	.018538	.012776	.124132
3.5	.025386	.028266	.008780	.050154	.006800	.009006	.005466	.045372
4.0	.022130	.018718	.004950	.023916	.004950	.004670	.002454	.017274
4.5	.019596	.012538	.002812	.011472	.003834	.002554	.001144	.006784
5.0	.017580	.008482	.001606	.005532	.003110	.001460	.000550	.002728
6.0	.014604	.003978	.000534	.001302	.002258	.000532	.000136	.000466
7.0	.012528	.001916	.000180	.000310	.001788	.000216	.000036	.000084
8.0	.011008	.000942	.000062	.000074	.001496	.000094	.000010	.000016
9.0	.009848	.000472	.000022	.000018	.001298	.000044	.000004	.000004
10.0	.008938	.000240	.000008	.000004	.001158	.000020	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.432636	2.282016	3.407994	4.108566	1.086308	5.912174	5.880136	52.153440
.2	1.358328	2.041498	2.975406	3.425366	.840324	4.507594	4.473366	39.182980
.3	1.290326	1.831246	2.602794	2.865560	.654836	3.457162	3.421732	29.572080
.4	1.227962	1.646760	2.280976	2.404700	.514138	2.667552	2.631770	22.421020
.5	1.170656	1.484292	2.002320	2.023672	.406762	2.070868	2.035398	17.077590
.6	1.117888	1.340734	1.760460	1.707390	.324296	1.617514	1.582872	13.067540
.7	1.069200	1.213476	1.550068	1.443890	.260552	1.271136	1.237708	10.044850
.8	1.024192	1.100332	1.366672	1.223634	.210952	1.004990	.973046	7.756270
.9	.982508	.999452	1.206494	1.038956	.172098	.799318	.769032	6.015726
1.0	.943874	.909270	1.066334	.883680	.141456	.639456	.610934	4.686060
1.1	.907866	.828454	.943486	.752798	.117126	.514482	.487770	3.665736
1.2	.874376	.755862	.835640	.642216	.097678	.416222	.391318	2.879330
1.3	.843136	.690520	.740824	.548592	.082028	.338524	.315396	2.270576
1.4	.813944	.631584	.657350	.469174	.069352	.276740	.255334	1.797334
1.5	.786622	.578326	.583762	.401688	.059018	.227344	.207582	1.427900
1.6	.761004	.530116	.518814	.344252	.050540	.187640	.169440	1.138342
1.7	.736954	.486402	.461428	.295296	.043542	.155562	.138834	.910500
1.8	.714338	.446706	.410668	.253514	.037732	.129516	.114164	.730542
1.9	.693038	.410606	.365726	.217812	.032882	.108266	.094198	.587892
2.0	.672954	.377732	.325898	.187272	.028808	.090850	.077972	.474424
2.2	.636048	.320392	.259214	.138704	.022454	.064658	.053898	.311372
2.4	.602966	.272508	.206592	.102966	.017840	.046624	.037654	.206284
2.6	.573162	.232354	.164952	.076586	.014428	.034020	.026556	.137802
2.8	.546188	.198560	.131918	.057064	.011860	.025092	.018886	.092732
3.0	.521670	.170024	.105658	.042584	.009900	.018690	.013530	.062810
3.5	.469176	.116260	.060998	.020600	.006690	.009300	.006044	.024286
4.0	.426470	.080244	.035456	.010032	.004864	.004858	.002788	.009650
4.5	.391046	.055814	.020724	.004910	.003750	.002646	.001322	.003916
5.0	.361172	.039074	.012170	.002414	.003028	.001498	.000640	.001616
6.0	.313500	.019454	.004246	.000590	.002188	.000530	.000158	.000286
7.0	.277050	.009846	.001500	.000146	.001732	.000210	.000042	.000052
8.0	.248196	.005048	.000534	.000036	.001452	.000090	.000012	.000010
9.0	.224736	.002614	.000192	.000010	.001266	.000042	.000004	.000002
10.0	.205256	.001364	.000070	.000002	.001134	.000020	.000002	.000000

TABLE 12 R. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 85 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.134152	.860330	.669428	12.028690	2.429638	12.501690	12.186860	209.298600
.2	.124324	.754954	.576076	9.948170	1.806782	9.219414	8.969842	153.130400
.3	.115468	.664668	.496986	8.257966	1.351660	6.831810	6.631546	112.452600
.4	.107476	.586982	.429760	6.878154	1.017658	5.088408	4.925772	82.899980
.5	.100246	.519874	.372442	5.746588	.771408	3.810252	3.676648	61.358720
.6	.093692	.461680	.323430	4.814684	.588958	2.869180	2.758224	45.602600
.7	.087742	.411032	.281404	4.044218	.453070	2.173150	2.080076	34.036320
.8	.082330	.366800	.245276	3.404942	.351294	1.655910	1.577118	25.513860
.9	.077396	.328046	.214140	2.872762	.274620	1.269614	1.202360	19.209720
1.0	.072892	.293986	.187246	2.428416	.216500	.979608	.921776	14.527870
1.1	.068770	.263966	.163964	2.056376	.172162	.760710	.710658	11.036510
1.2	.064994	.237436	.143772	1.744098	.138108	.594562	.550994	8.421950
1.3	.061528	.213928	.126224	1.481386	.111772	.467724	.429612	6.455656
1.4	.058340	.193048	.110948	1.259906	.091262	.370326	.336842	4.970450
1.5	.055404	.174462	.097626	1.072832	.075170	.295086	.265556	3.843738
1.6	.052694	.157882	.085992	.914548	.062454	.236614	.210486	2.985248
1.7	.050190	.143062	.075818	.780408	.052330	.190894	.167710	2.328262
1.8	.047872	.129792	.066908	.666564	.044210	.154930	.134306	1.823306
1.9	.045724	.117888	.059094	.569816	.037650	.126470	.108082	1.433526
2.0	.043730	.107190	.052234	.487500	.032310	.103812	.087388	1.131386
2.2	.040150	.088890	.040900	.357592	.024322	.071062	.057888	.712426
2.4	.037038	.073988	.032110	.262970	.018808	.049602	.038974	.454680
2.6	.034316	.061790	.025270	.193816	.014904	.035240	.026624	.293734
2.8	.031926	.051760	.019928	.143124	.012072	.025440	.018426	.191846
3.0	.029816	.043480	.015746	.105874	.009970	.018630	.012898	.126528
3.5	.025512	.028428	.008804	.050146	.006650	.009028	.005516	.046332
4.0	.022238	.018836	.004966	.023930	.004820	.004668	.002476	.017672
4.5	.019688	.012624	.002822	.011488	.003722	.002544	.001154	.006950
5.0	.017660	.008542	.001614	.005542	.003014	.001450	.000554	.002800
6.0	.014662	.004008	.000536	.001306	.002184	.000524	.000136	.000480
7.0	.012574	.001932	.000182	.000312	.001730	.000212	.000036	.000086
8.0	.011044	.000950	.000062	.000076	.001448	.000092	.000010	.000016
9.0	.009878	.000476	.000022	.000018	.001258	.000042	.000004	.000004
10.0	.008962	.000242	.000008	.000004	.001124	.000020	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.430980	2.270130	3.382556	4.083250	1.089120	5.932332	5.896338	52.376100
.2	1.357106	2.031508	2.953948	3.404574	.842582	4.524400	4.487106	39.361360
.3	1.289484	1.822850	2.584668	2.848424	.656654	3.471222	3.433400	29.715640
.4	1.227452	1.639690	2.265648	2.390538	.515608	2.679362	2.641674	22.537060
.5	1.170430	1.478344	1.989340	2.011938	.407950	2.080816	2.043814	17.171770
.6	1.117906	1.335730	1.749458	1.697642	.325258	1.625912	1.590030	13.144290
.7	1.069434	1.209268	1.540734	1.435778	.261328	1.278250	1.243800	10.107610
.8	1.024610	1.096796	1.358744	1.216866	.211576	1.011028	.978234	7.807764
.9	.983082	.996486	1.199754	1.033306	.172598	.804454	.773454	6.058124
1.0	.944538	.906784	1.060600	.878956	.141854	.643830	.614708	4.721064
1.1	.908694	.826376	.938606	.748838	.117438	.518216	.490990	3.694720
1.2	.875306	.754130	.831484	.638896	.097920	.419412	.394068	2.903378
1.3	.844152	.689082	.737280	.545804	.082210	.341254	.317748	2.290584
1.4	.815032	.630394	.654326	.466832	.069484	.279080	.257344	1.814006
1.5	.787768	.577348	.581182	.399718	.059108	.229350	.209304	1.441828
1.6	.762204	.529316	.516612	.342594	.050594	.189360	.170916	1.149994
1.7	.738194	.485754	.459548	.293900	.043568	.157040	.140098	.920260
1.8	.715612	.446186	.409062	.252340	.037732	.130786	.115248	.738732
1.9	.694342	.410196	.364354	.216822	.032860	.109356	.095128	.594774
2.0	.674278	.377412	.324726	.186436	.028770	.091786	.078770	.480212
2.2	.637402	.320216	.258358	.138110	.022390	.065350	.054486	.315478
2.4	.604334	.272432	.205968	.102542	.017758	.047134	.038090	.209208
2.6	.574534	.232348	.164496	.076284	.014332	.034396	.026878	.139892
2.8	.547554	.198600	.131588	.056848	.011758	.025368	.019124	.094228
3.0	.523024	.170096	.105416	.042430	.009796	.018892	.013708	.063882
3.5	.470482	.116362	.060892	.020534	.006584	.009390	.006128	.024758
4.0	.427718	.080346	.035410	.010002	.004764	.004894	.002828	.009858
4.5	.392232	.055904	.020706	.004898	.003658	.002660	.001340	.004008
5.0	.362300	.039146	.012164	.002408	.002946	.001500	.000648	.001656
6.0	.314518	.019498	.004246	.000588	.002122	.000526	.000160	.000294
7.0	.277978	.009872	.001500	.000146	.001680	.000206	.000042	.000054
8.0	.249048	.005062	.000536	.000036	.001408	.000088	.000012	.000010
9.0	.225522	.002622	.000192	.000010	.001228	.000040	.000004	.000002
10.0	.205984	.001368	.000070	.000002	.001102	.000020	.000002	.000000

TABLE 12 S. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, λ = 90 degrees

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.133930	.861202	.667856	11.966230	2.429370	12.528430	12.217140	210.141000
.2	.124140	.755716	.574826	9.900980	1.806408	9.238806	8.992114	153.751000
.3	.115318	.665340	.495988	8.222274	1.351236	6.845942	6.648012	112.911600
.4	.107352	.587582	.428964	6.851102	1.017218	5.098748	4.938020	83.241300
.5	.100144	.520412	.371806	5.726064	.770974	3.817850	3.685804	61.613600
.6	.093612	.462166	.322922	4.799102	.588542	2.874780	2.765110	45.793840
.7	.087678	.411474	.281000	4.032380	.452674	2.177302	2.085288	34.180480
.8	.082280	.367204	.244952	3.395942	.350924	1.658996	1.581086	25.623100
.9	.077358	.328416	.213884	2.865930	.274276	1.271922	1.205398	19.292960
1.0	.072864	.294330	.187042	2.423230	.216180	.981340	.924120	14.591600
1.1	.068752	.264284	.163806	2.052444	.171864	.762016	.712476	11.085530
1.2	.064982	.237730	.143646	1.741132	.137832	.595548	.552412	8.459862
1.3	.061522	.214200	.126126	1.479152	.111516	.468470	.430724	6.485124
1.4	.058338	.193302	.110872	1.258234	.091024	.370890	.337720	4.993470
1.5	.055406	.174698	.097570	1.071588	.074948	.295514	.266254	3.861800
1.6	.052700	.158104	.085950	.913630	.062246	.236938	.211042	2.999488
1.7	.050200	.143268	.075788	.779738	.052134	.191138	.168156	2.339538
1.8	.047884	.129984	.066886	.666084	.044026	.155114	.134666	1.832270
1.9	.045738	.118068	.059080	.569478	.037476	.126606	.108374	1.440688
2.0	.043744	.107360	.052224	.487270	.032146	.103912	.087624	1.137126
2.2	.040166	.089038	.040900	.357502	.024174	.071112	.058046	.716152
2.4	.037054	.074116	.032114	.262956	.018676	.049622	.039080	.457130
2.6	.034334	.061902	.025276	.193840	.014782	.035242	.026696	.295366
2.8	.031942	.051858	.019936	.143166	.011960	.025430	.018474	.192942
3.0	.029832	.043566	.015756	.105920	.009870	.018616	.012932	.127272
3.5	.025524	.028488	.008812	.050184	.006566	.009010	.005530	.046622
4.0	.022246	.018878	.004972	.023954	.004750	.004652	.002480	.017788
4.5	.019694	.012652	.002826	.011502	.003662	.002532	.001156	.007000
5.0	.017664	.008562	.001616	.005550	.002962	.001440	.000554	.002820
6.0	.014662	.004018	.000538	.001308	.002146	.000518	.000136	.000482
7.0	.012572	.001936	.000182	.000312	.001698	.000208	.000036	.000088
8.0	.011040	.000952	.000062	.000076	.001422	.000090	.000010	.000016
9.0	.009874	.000476	.000022	.000018	.001238	.000042	.000004	.000004
10.0	.008958	.000242	.000008	.000004	.001106	.000020	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.428002	2.272150	3.373224	4.055680	1.088608	5.941750	5.901310	52.476660
.2	1.354446	2.033286	2.946188	3.383122	.842212	4.531728	4.491340	39.441240
.3	1.287104	1.824416	2.578208	2.831660	.656384	3.476960	3.437006	29.779300
.4	1.225318	1.641086	2.260244	2.377392	.515406	2.683888	2.644750	22.588000
.5	1.168516	1.479590	1.984810	2.001592	.407794	2.084412	2.046438	17.212660
.6	1.116188	1.336852	1.745654	1.689474	.325134	1.628794	1.592270	13.177170
.7	1.067884	1.210282	1.537532	1.429304	.261226	1.280574	1.245712	10.134190
.8	1.023214	1.097716	1.356042	1.211720	.211488	1.012916	.979868	7.829272
.9	.981822	.997322	1.197468	1.029202	.172518	.805992	.774852	6.075594
1.0	.943396	.907552	1.058664	.875674	.141778	.645094	.615902	4.735294
1.1	.907660	.827080	.936964	.746210	.117366	.519258	.492014	3.706336
1.2	.874370	.754780	.830088	.636782	.097848	.420274	.394946	2.912900
1.3	.843300	.689680	.736092	.544104	.082138	.341970	.318500	2.298394
1.4	.814256	.630950	.653316	.465460	.069412	.279676	.257990	1.820432
1.5	.787062	.577864	.580320	.398608	.059034	.229848	.209858	1.447120
1.6	.761558	.529796	.515878	.341694	.050520	.189778	.171392	1.154364
1.7	.737604	.486200	.458920	.293170	.043492	.157388	.140508	.923880
1.8	.715070	.446602	.408526	.251746	.037658	.131076	.115600	.741734
1.9	.693844	.410582	.363896	.216340	.032786	.109600	.095430	.597266
2.0	.673820	.377774	.324334	.186044	.028694	.091990	.079030	.482284
2.2	.637012	.320532	.258072	.137848	.022314	.065492	.054680	.316918
2.4	.604000	.272708	.205758	.102368	.017684	.047234	.038234	.210214
2.6	.574246	.232590	.164342	.076168	.014260	.034464	.026984	.140596
2.8	.547304	.198812	.131474	.056770	.011688	.025412	.019204	.094724
3.0	.522806	.170280	.105334	.042378	.009726	.018920	.013766	.064234
3.5	.470320	.116494	.060856	.020516	.006522	.009396	.006156	.024906
4.0	.427594	.080440	.035394	.009996	.004708	.004892	.002842	.009922
4.5	.392134	.055972	.020700	.004896	.003610	.002654	.001346	.004036
5.0	.362222	.039196	.012162	.002408	.002904	.001494	.000652	.001670
6.0	.314466	.019524	.004246	.000588	.002090	.000524	.000162	.000296
7.0	.277942	.009886	.001500	.000146	.001652	.000204	.000042	.000054
8.0	.249022	.005068	.000536	.000036	.001386	.000088	.000012	.000010
9.0	.225504	.002624	.000192	.000010	.001210	.000040	.000004	.000002
10.0	.205972	.001370	.000070	.000002	.001086	.000018	.000002	.000000

TABLE 13. CRRES Omnidirectional Geometric Factors for Power Law Spectra Mirror Plane Path Length Distribution, Spin Average

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.146584	1.037831	.855738	15.675260	2.050491	8.932288	8.628024	129.712000
.2	.133789	.883630	.717041	12.549840	1.521226	6.559559	6.326165	94.560700
.3	.122443	.755711	.602896	10.099350	1.135013	4.838814	4.657698	69.171100
.4	.112363	.649109	.508606	8.167010	.852027	3.586516	3.444265	50.778880
.5	.103387	.559869	.430432	6.634768	.643765	2.671733	2.558622	37.414840
.6	.095379	.484829	.365387	5.413247	.489777	2.000849	1.909790	27.673250
.7	.088218	.421451	.311077	4.434415	.375353	1.506768	1.432567	20.548560
.8	.081802	.367692	.265575	3.646196	.289877	1.141282	1.080106	15.319720
.9	.076041	.321899	.227328	3.008515	.225670	.869657	.818659	11.468460
1.0	.070856	.282734	.195076	2.490355	.177156	.666800	.623845	8.621323
1.1	.066181	.249102	.167796	2.067574	.140274	.514523	.478000	6.508464
1.2	.061956	.220114	.144654	1.721282	.112055	.399605	.368284	4.934375
1.3	.058130	.195035	.124968	1.436618	.090319	.312401	.285336	3.756986
1.4	.054659	.173263	.108176	1.201830	.073464	.245850	.222304	2.872742
1.5	.051502	.154298	.093816	1.007576	.060299	.194764	.174157	2.205922
1.6	.048625	.137725	.081506	.846393	.049943	.155316	.137185	1.700984
1.7	.045999	.123197	.070929	.712294	.041737	.124668	.108645	1.317034
1.8	.043596	.110427	.061822	.600453	.035186	.100713	.086496	1.023873
1.9	.041393	.099170	.053963	.506960	.029917	.081874	.069216	.799106
2.0	.039370	.089220	.047169	.428642	.025650	.066968	.055663	.626073
2.2	.035792	.072577	.036178	.307633	.019303	.045598	.036512	.388544
2.4	.032740	.059396	.027878	.221805	.014957	.031739	.024375	.244477
2.6	.030119	.048871	.021571	.160564	.011898	.022543	.016535	.155788
2.8	.027851	.040405	.016753	.116637	.009689	.016308	.01138u	.100424
3.0	.025877	.033551	.013054	.084989	.008055	.011996	.007935	.065414
3.5	.021931	.021429	.007085	.038955	.005469	.005925	.003379	.023294
4.0	.019001	.013955	.003903	.018088	.004034	.003147	.001522	.008679
4.5	.016759	.009232	.002175	.008485	.003158	.001770	.000716	.003349
5.0	.014997	.006187	.001224	.004014	.002583	.001041	.000348	.001328
6.0	.012427	.002867	.000397	.000916	.001894	.000398	.000089	.000223
7.0	.010652	.001372	.000132	.000213	.001505	.000167	.000025	.000040
8.0	.009359	.000672	.000045	.000050	.001261	.000075	.000007	.000007
9.0	.008377	.000336	.000015	.000012	.001096	.000035	.000002	.000001
10.0	.007606	.000171	.000006	.000003	.000978	.000017	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	NILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.616791	2.877257	4.546142	5.972407	1.010989	4.941678	4.937280	37.830890
.2	1.517070	2.517495	3.893998	4.829003	.775376	3.715015	3.705763	28.153810
.3	1.426934	2.211058	3.344733	3.923840	.598713	2.807905	2.795254	21.038200
.4	1.345271	1.948880	2.880553	3.203207	.465543	2.134123	2.119213	15.786790
.5	1.271117	1.723599	2.487002	2.626345	.364603	1.631330	1.615038	11.896460
.6	1.203627	1.529212	2.152287	2.162146	.287652	1.254316	1.237316	9.003198
.7	1.142062	1.360806	1.866761	1.786736	.228641	.970200	.952991	6.842873
.8	1.085777	1.214341	1.622499	1.481691	.183113	.754978	.737933	5.223264
.9	1.034203	1.086486	1.412967	1.232715	.147769	.591077	.574460	4.004029
1.0	.986844	.974482	1.232763	1.028647	.120157	.465576	.449574	3.082373
1.1	.943261	.876031	1.077401	.860730	.098449	.368945	.353682	2.382755
1.2	.903067	.789217	.943147	.722052	.081271	.294123	.279674	1.849461
1.3	.865924	.712433	.826877	.607133	.067592	.235861	.222263	1.441259
1.4	.831527	.644324	.725975	.511600	.056627	.190234	.177502	1.127514
1.5	.799612	.583748	.638237	.431951	.047783	.154300	.142425	.885388
1.6	.769942	.529732	.561807	.365365	.040603	.125840	.114802	.697784
1.7	.742306	.481452	.495111	.309561	.034739	.103175	.092942	.551856
1.8	.716518	.438200	.436816	.262684	.029920	.085025	.075560	.437909
1.9	.692410	.399370	.385785	.223223	.025935	.070414	.061676	.348607
2.0	.669833	.364440	.341048	.189939	.022622	.058590	.050535	.278367
2.2	.628757	.304537	.267257	.138009	.017519	.041112	.034292	.179027
2.4	.592381	.255550	.210117	.100697	.013873	.029331	.023576	.116359
2.6	.559971	.215245	.165676	.073738	.011213	.021245	.016399	.076348
2.8	.530930	.181901	.130975	.054167	.009234	.015604	.011528	.050522
3.0	.504771	.154183	.103785	.039900	.007735	.011607	.008180	.033688
3.5	.449506	.103140	.058524	.018768	.005300	.005817	.003595	.012582
4.0	.405268	.069919	.033349	.008929	.003915	.003095	.001647	.004856
4.5	.369043	.047910	.019165	.004286	.003063	.001730	.000781	.001923
5.0	.338811	.033118	.011091	.002072	.002503	.001009	.000380	.000778
6.0	.291149	.016160	.003777	.000492	.001835	.000379	.000097	.000134
7.0	.255190	.008055	.001309	.000119	.001461	.000157	.000027	.000024
8.0	.227032	.004081	.000459	.000029	.001228	.000070	.000008	.000004
9.0	.204349	.002093	.000163	.000007	.001071	.000033	.000002	.000001
10.0	.185670	.001085	.000058	.000002	.000960	.000016	.000001	.000000

TABLE 14 A. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\text{Sin}^{999}\ \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 0$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.169959	1.372362	1.238301	17.474520	1.368842	2.924576	2.682787	5.047819
.2	.151759	1.107444	.989264	12.850990	1.002773	2.389534	1.914574	3.603753
.3	.135896	.897418	.792939	9.485748	.737567	1.496364	1.369272	2.579229
.4	.122044	.730353	.637721	7.028551	.544815	1.074253	.981531	1.850896
.5	.109926	.596998	.514642	5.228437	.404253	.773300	.705322	1.332006
.6	.099304	.490168	.416749	3.905148	.301382	.558288	.508181	.961481
.7	.089976	.404268	.338646	2.928901	.225815	.404340	.367182	.696254
.8	.081767	.334935	.276135	2.206019	.170087	.293856	.266112	.505906
.9	.074528	.278753	.225943	1.668710	.128821	.214363	.193495	.368921
1.0	.068131	.233045	.185510	1.267773	.098132	.157014	.141186	.270048
1.1	.062466	.195708	.152831	.967397	.075207	.115518	.103407	.198463
1.2	.057438	.165082	.126332	.741444	.058003	.085398	.076041	.146462
1.3	.052966	.139856	.104773	.570769	.045029	.063461	.056157	.108558
1.4	.048980	.118991	.087174	.441307	.035197	.047426	.041662	.080828
1.5	.045419	.101660	.072760	.342692	.027707	.035657	.031058	.060463
1.6	.042231	.087204	.060917	.267253	.021971	.026983	.023272	.045447
1.7	.039369	.075097	.051153	.209300	.017555	.020560	.017532	.034328
1.8	.036795	.064914	.043079	.164592	.014136	.015782	.013282	.026060
1.9	.034475	.056316	.036380	.129955	.011474	.012207	.010121	.019884
2.0	.032378	.049026	.030806	.103011	.009389	.009518	.007760	.015249
2.2	.028756	.037521	.022258	.065458	.006445	.005932	.004648	.009107
2.4	.025760	.029065	.016235	.042191	.004576	.003827	.002856	.005549
2.6	.023259	.022761	.011945	.027554	.003360	.002554	.001801	.003447
2.8	.021153	.018001	.008858	.018215	.002549	.001761	.001165	.002181
3.0	.019366	.014361	.006615	.012175	.001995	.001252	.000772	.001403
3.5	.015928	.008438	.003276	.004639	.001219	.000596	.000302	.000497
4.0	.013496	.005151	.001674	.001859	.000856	.000320	.000132	.000189
4.5	.011706	.003239	.000877	.000775	.000662	.000186	.000062	.000076
5.0	.010344	.002086	.000468	.000333	.000547	.000114	.000031	.000032
6.0	.008425	.000914	.000140	.000066	.000423	.000047	.000008	.000006
7.0	.007146	.000423	.000044	.000014	.000360	.000021	.000002	.000001
8.0	.006238	.000204	.000014	.000003	.000323	.000010	.000001	.000000
9.0	.005562	.000101	.000005	.000001	.000301	.000005	.000000	.000000
10.0	.005039	.000051	.000002	.000000	.000286	.000003	.000000	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.952599	4.075730	7.086521	9.965312	.873338	2.808327	2.777881	2.398102
.2	1.805495	3.429896	5.870975	7.510330	.656508	2.015253	1.990602	1.711716
.3	1.674255	2.899270	4.880646	5.682631	.495788	1.449400	1.429414	1.224821
.4	1.556893	2.461434	4.070998	4.316916	.376190	1.044950	1.028711	.878743
.5	1.451695	2.098624	3.406771	3.292586	.286831	.755324	.742090	.632230
.6	1.357173	1.796689	2.859964	2.521393	.219788	.547506	.536681	.456235
.7	1.272042	1.544352	2.408297	1.938546	.169273	.398073	.389177	.330283
.8	1.195180	1.332566	2.033965	1.496346	.131048	.290376	.283030	.239909
.9	1.125620	1.154077	1.722704	1.159552	.101994	.212571	.206470	.174887
1.0	1.062517	1.003033	1.463060	.902048	.079812	.156213	.151118	.127968
1.1	1.005134	.874702	1.245791	.704402	.062800	.115277	.110995	.094008
1.2	.952830	.765241	1.063433	.552121	.049692	.085454	.081832	.069347
1.3	.905042	.671523	.909923	.434345	.039547	.063656	.060574	.051377
1.4	.861281	.590987	.780332	.342913	.031657	.047668	.045029	.038235
1.5	.821114	.521534	.670632	.271671	.025493	.035899	.033625	.028587
1.6	.784163	.461436	.577527	.215958	.020654	.027200	.025229	.021476
1.7	.750095	.409261	.498306	.172234	.016838	.020742	.019024	.016213
1.8	.718620	.363825	.430738	.137801	.013815	.015927	.014421	.012301
1.9	.689475	.324137	.372975	.110590	.011407	.012318	.010992	.009381
2.0	.662434	.289374	.323486	.089017	.009481	.009599	.008426	.007190
2.2	.613877	.231952	.244446	.058167	.006683	.005969	.005040	.004289
2.4	.571587	.187218	.185743	.038416	.004842	.003836	.003089	.002610
2.6	.534483	.152050	.141838	.025624	.003606	.002548	.001941	.001620
2.8	.501711	.124177	.108792	.017249	.002761	.001748	.001250	.001024
3.0	.472578	.101922	.083779	.011710	.002172	.001235	.000824	.000658
3.5	.412262	.063399	.044259	.004596	.001328	.000581	.000319	.000233
4.0	.365202	.040342	.023799	.001878	.000926	.000309	.000137	.000089
4.5	.327490	.026152	.012981	.000793	.000711	.000175	.000064	.000036
5.0	.296598	.017220	.007163	.000345	.000585	.000109	.000031	.000015
6.0	.249013	.007756	.002243	.000069	.000449	.000045	.000008	.000003
7.0	.214075	.003638	.000724	.000015	.000381	.000020	.000002	.000001
8.0	.187349	.001761	.000239	.000003	.000342	.000010	.000001	.000000
9.0	.166261	.000874	.000080	.000001	.000318	.000005	.000000	.000000
10.0	.149211	.000442	.000027	.000000	.000302	.000002	.000000	.000000

TABLE 14 B. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\text{Sin}^{999}\ \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 30$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.147365	1.060325	.888209	17.365420	1.917392	7.702781	7.412600	100.843500
.2	.133962	.903284	.746692	14.030890	1.422396	5.641826	5.420940	73.076610
.3	.122113	.772274	.629394	11.379230	1.061187	4.149562	3.979505	53.102270
.4	.111619	.662584	.531887	9.261209	.796529	3.065567	2.933046	38.698630
.5	.102305	.570416	.450599	7.562256	.601773	2.275411	2.170837	28.285720
.6	.094023	.492698	.382646	6.193974	.457791	1.697330	1.613748	20.738040
.7	.086644	.426935	.325684	5.087847	.350823	1.272770	1.205100	15.252330
.8	.080055	.371100	.277813	4.190430	.270936	.959677	.904199	11.253990
.9	.074161	.323535	.237478	3.459917	.210947	.727787	.681753	8.331263
1.0	.068876	.282883	.203409	2.863392	.165636	.555257	.516624	6.188381
1.1	.064127	.248027	.174566	2.374833	.131203	.426279	.393515	4.612415
1.2	.059853	.218048	.150091	1.973611	.104870	.329377	.301322	3.449735
1.3	.055996	.192186	.129276	1.643259	.084598	.256193	.231964	2.589188
1.4	.052510	.169810	.111538	1.370609	.068884	.200623	.179537	1.950173
1.5	.049351	.150394	.096390	1.145077	.056616	.158190	.139715	1.474080
1.6	.046483	.133500	.083428	.958129	.046971	.125600	.109318	1.118170
1.7	.043875	.118760	.072318	.802860	.039330	.100422	.085998	.851198
1.8	.041497	.105868	.062776	.673665	.033233	.080851	.068017	.650255
1.9	.039325	.094563	.054567	.565983	.028330	.065545	.054081	.498486
2.0	.037336	.084626	.047494	.476084	.024358	.053498	.043225	.383465
2.2	.033837	.068139	.036113	.337985	.018450	.036354	.028034	.229245
2.4	.030872	.055229	.027585	.240925	.014400	.025333	.018535	.138875
2.6	.028339	.045037	.021160	.172371	.011543	.018069	.012477	.085207
2.8	.026160	.036930	.016295	.123736	.009472	.013165	.008540	.052919
3.0	.024273	.030436	.012594	.089095	.007934	.009777	.005934	.033249
3.5	.020526	.019134	.006706	.039661	.005479	.004985	.002530	.010902
4.0	.017767	.012311	.003632	.017913	.004092	.002747	.001153	.003795
4.5	.015667	.008072	.001996	.008190	.003231	.001602	.000553	.001392
5.0	.014025	.005374	.001110	.003784	.002656	.000973	.000276	.000534
6.0	.011633	.002469	.000353	.000829	.001953	.000391	.000075	.000088
7.0	.009985	.001176	.000116	.000187	.001549	.000169	.000022	.000016
8.0	.008783	.000575	.000039	.000043	.001293	.000077	.000007	.000003
9.0	.007870	.000287	.000013	.000010	.001119	.000036	.000002	.000001
10.0	.007153	.000145	.000005	.000002	.000995	.000018	.000001	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				multiply by 10^{-3}	LOLET CHANNEL		
N	1	2	3	4	1	2	3	4
.1	1.642204	2.948958	4.706514	6.200679	.971872	4.686921	4.752305	36.250030
.2	1.536984	2.585707	4.046568	5.085587	.743532	3.499620	3.543764	26.690310
.3	1.442078	2.274538	3.487111	4.186240	.572617	2.625187	2.653750	19.712910
.4	1.356280	2.006994	3.011520	3.457601	.444026	1.978727	1.995912	14.605710
.5	1.278548	1.776111	2.606153	2.864755	.346762	1.498906	1.507835	10.856460
.6	1.207958	1.576169	2.259748	2.380451	.272785	1.141297	1.144289	8.095836
.7	1.143713	1.402426	1.963007	1.983331	.216197	.873634	.872412	6.056931
.8	1.085114	1.250953	1.708216	1.656562	.172656	.672400	.668246	4.546398
.9	1.031544	1.118479	1.488955	1.386798	.138951	.520417	.514278	3.423790
1.0	.982465	1.002269	1.299867	1.163423	.112700	.405088	.397667	2.586840
1.1	.937403	.900028	1.136475	.977934	.092126	.317148	.308960	1.960859
1.2	.895940	.809827	.995011	.823506	.075900	.249760	.241182	1.491174
1.3	.857710	.730038	.872312	.694625	.063021	.197858	.189164	1.137624
1.4	.822385	.659279	.765701	.586823	.052732	.157677	.149060	.870645
1.5	.789679	.596375	.672918	.496465	.044461	.126406	.118003	.668398
1.6	.759339	.540327	.592043	.420583	.037769	.101941	.093843	.514703
1.7	.731137	.490276	.521442	.356743	.032320	.082698	.074965	.397539
1.8	.704872	.445491	.459723	.302945	.027855	.067480	.060148	.307949
1.9	.680367	.405335	.405698	.257539	.024173	.055381	.048467	.239234
2.0	.657462	.369263	.358347	.219161	.021120	.045709	.039219	.186373
2.2	.615899	.307542	.280292	.159153	.016432	.031654	.025992	.114034
2.4	.579216	.257233	.219923	.115965	.013092	.022387	.017493	.070500
2.6	.546632	.215981	.173045	.084750	.010660	.016147	.011944	.044015
2.8	.517518	.181972	.136510	.062103	.008850	.011860	.008265	.027737
3.0	.491360	.153797	.107941	.045617	.007476	.008857	.005791	.017634
3.5	.436305	.102197	.060552	.021286	.005229	.004547	.002498	.005889
4.0	.392431	.068870	.034339	.010041	.003929	.002510	.001143	.002061
4.5	.356628	.046940	.019647	.004779	.003113	.001464	.000548	.000752
5.0	.326830	.032290	.011325	.002291	.002566	.000889	.000273	.000285
6.0	.279992	.015618	.003830	.000536	.001894	.000357	.000074	.000046
7.0	.244769	.007725	.001319	.000128	.001508	.000155	.000021	.000008
8.0	.217262	.003885	.000461	.000031	.001263	.000071	.000007	.000002
9.0	.195159	.001980	.000163	.000008	.001097	.000033	.000002	.000000
10.0	.177000	.001019	.000058	.000002	.000978	.000016	.000001	.000000

TABLE 14 C. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^{999} \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 60$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.136363	.914330	.713703	13.147950	2.315532	11.287090	11.039140	180.547600
.2	.125867	.797369	.611903	10.832820	1.722852	8.315495	8.119304	131.902300
.3	.116445	.697719	.525942	8.958397	1.289605	6.155046	5.997737	96.705880
.4	.107972	.612472	.453125	7.433504	.971531	4.578523	4.450719	71.162960
.5	.100337	.539258	.391257	6.187392	.736938	3.423585	3.318426	52.566690
.6	.093445	.476138	.338538	5.164846	.563060	2.573969	2.486414	38.982930
.7	.087211	.421527	.293494	4.322506	.433511	1.946220	1.872512	29.026190
.8	.081562	.374114	.254908	3.626140	.336452	1.480253	1.417580	21.701770
.9	.076433	.332814	.221774	3.048554	.263309	1.132699	1.078932	16.293830
1.0	.071768	.296727	.193255	2.568035	.207850	.872156	.825661	12.285580
1.1	.067518	.265102	.168657	2.167175	.165528	.675812	.635327	9.303058
1.2	.063638	.237310	.147396	1.831907	.133015	.527042	.491576	7.074906
1.3	.060090	.212822	.128984	1.550842	.107865	.413686	.382456	5.403520
1.4	.056840	.191190	.113011	1.314720	.088271	.326818	.299195	4.144571
1.5	.053857	.172036	.099131	1.115965	.072894	.259858	.235330	3.192346
1.6	.051115	.155039	.087050	.948366	.060738	.207936	.186085	2.469091
1.7	.048591	.139924	.076520	.806805	.051055	.167435	.147912	1.917453
1.8	.046263	.126456	.067328	.687056	.043286	.135652	.118166	1.494961
1.9	.044112	.114433	.059294	.585620	.037004	.110561	.094865	1.170044
2.0	.042122	.103681	.052263	.499585	.031887	.090635	.076518	.919158
2.2	.038566	.085406	.040701	.364422	.024221	.061931	.050455	.573288
2.4	.035494	.070651	.031788	.266561	.018916	.043205	.033825	.362320
2.6	.032824	.058671	.024892	.195451	.015146	.030722	.023019	.231762
2.8	.030491	.048895	.019539	.143616	.012399	.022229	.015878	.149872
3.0	.028441	.040879	.015369	.105729	.010351	.016340	.011085	.097871
3.5	.024289	.026459	.008505	.049517	.007076	.008038	.004723	.034979
4.0	.021157	.017394	.004754	.023386	.005234	.004247	.002120	.013036
4.5	.018732	.011585	.002681	.011120	.004101	.002376	.000992	.005017
5.0	.016812	.007803	.001522	.005317	.003354	.001391	.000480	.001981
6.0	.013983	.003639	.000500	.001233	.002452	.000530	.000122	.000327
7.0	.012013	.001747	.000168	.000290	.001941	.000223	.000033	.000057
8.0	.010569	.000858	.000057	.000069	.001618	.000100	.000010	.000011
9.0	.009468	.000429	.000020	.000017	.001399	.000047	.000003	.000002
10.0	.008601	.000218	.000007	.000004	.001243	.000023	.000001	.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.470006	2.445119	3.639398	4.505936	1.063740	5.694265	5.693942	49.210950
.2	1.390431	2.179016	3.170706	3.747571	.821176	4.322374	4.316089	36.837980
.3	1.317788	1.947322	2.767852	3.127566	.638544	3.209577	3.288761	27.695030
.4	1.251336	1.744818	2.420649	2.618327	.500245	2.533340	2.519225	20.912240
.5	1.190423	1.567192	2.120655	2.198282	.394888	1.956430	1.940038	15.859950
.6	1.134472	1.410846	1.860824	1.850435	.314130	1.519824	1.501980	12.081110
.7	1.082978	1.272788	1.635275	1.561316	.251835	1.187646	1.169012	9.242899
.8	1.035493	1.150505	1.439071	1.320213	.203469	.933553	.914640	7.102089
.9	.991619	1.041881	1.268057	1.118528	.165670	.738119	.719320	5.480421
1.0	.951006	.945131	1.118720	.949344	.135932	.586973	.568575	4.246750
1.1	.913341	.858735	.988091	.807059	.112379	.469427	.451638	3.304233
1.2	.878347	.781403	.873638	.687116	.093600	.377502	.360467	2.581119
1.3	.845778	.712025	.773209	.585790	.078527	.305216	.289030	2.024012
1.4	.815409	.649654	.684958	.500023	.066349	.248064	.232779	1.593033
1.5	.787048	.593472	.607306	.427298	.056447	.202633	.188272	1.258296
1.6	.760516	.542770	.538897	.365530	.048343	.166330	.152895	.997289
1.7	.735656	.496933	.478559	.312990	.041671	.137172	.124645	.792996
1.8	.712325	.455429	.425283	.268238	.036143	.113634	.101990	.632512
1.9	.690397	.417788	.378194	.230072	.031537	.094542	.083743	.505994
2.0	.669756	.383602	.336533	.197485	.027677	.078983	.068989	.405915
2.2	.631933	.324204	.266947	.145802	.021670	.055774	.047254	.263269
2.4	.598139	.274837	.212207	.107906	.017318	.039962	.032731	.172375
2.6	.567790	.233624	.169020	.080029	.014103	.029018	.022901	.113817
2.8	.540400	.199082	.134858	.059464	.011685	.021332	.016168	.075718
3.0	.515566	.170028	.107772	.044256	.009836	.015863	.011507	.050709
3.5	.462598	.115600	.061905	.021278	.006792	.007915	.005072	.019077
4.0	.419701	.079411	.035822	.010304	.005036	.004181	.002319	.007385
4.5	.384243	.055017	.020856	.005018	.003946	.002320	.001094	.002923
5.0	.354422	.038386	.012205	.002455	.003225	.001344	.000530	.001178
6.0	.306963	.019009	.004233	.000594	.002359	.000501	.000133	.000200
7.0	.270774	.009582	.001488	.000146	.001872	.000207	.000036	.000035
8.0	.242182	.004896	.000529	.000036	.001565	.000092	.000010	.000007
9.0	.218972	.002528	.000189	.000009	.001358	.000043	.000003	.000001
10.0	.199727	.001316	.000068	.000002	.001211	.000021	.000001	.000000

TABLE 14 D. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^{999} \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 90$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	.134196	.863331	.670088	11.956810	2.418655	12.585230	12.248280	211.074900
.2	.124338	.757542	.576740	9.894026	1.798319	9.280722	9.014510	154.433100
.3	.115459	.666942	.497639	8.217236	1.345072	6.876992	6.664150	113.411800
.4	.107445	.588968	.430395	6.847532	1.012480	5.121864	4.949686	83.609410
.5	.100199	.521638	.373051	5.723605	.767294	3.835147	3.694263	61.885650
.6	.093633	.463260	.324010	4.797482	.585653	2.887792	2.771260	45.995770
.7	.087673	.412458	.281952	4.031393	.450385	2.187134	2.089777	34.331100
.8	.082252	.368094	.245789	3.395423	.349089	1.666469	1.584371	25.735870
.9	.077312	.329226	.214620	2.865754	.272790	1.277627	1.207808	19.377810
1.0	.072802	.295067	.187692	2.423295	.214965	.985717	.925891	14.655730
1.1	.068677	.264960	.164379	2.052687	.170859	.765391	.713782	11.134240
1.2	.064898	.238351	.144154	1.741486	.136993	.598162	.553378	8.497037
1.3	.061429	.214773	.126576	1.479579	.110809	.470505	.431439	6.513611
1.4	.058240	.193830	.111271	1.258703	.090422	.372481	.338248	5.015416
1.5	.055302	.175186	.097923	1.072077	.074432	.296762	.266645	3.878785
1.6	.052593	.158554	.086264	.914121	.061800	.237920	.211332	3.012686
1.7	.050089	.143686	.076065	.780218	.051747	.191913	.168370	2.349841
1.8	.047772	.130371	.067132	.666545	.043686	.155726	.134823	1.840346
1.9	.045625	.118426	.059298	.569918	.037176	.127091	.108488	1.447040
2.0	.043631	.107692	.052420	.487681	.031880	.104298	.087707	1.142149
2.2	.040052	.089323	.041053	.357857	.023961	.071354	.058087	.719323
2.4	.036942	.074362	.032236	.263254	.018501	.049773	.039099	.459158
2.6	.034224	.062113	.025373	.194085	.014638	.035335	.026703	.296678
2.8	.031836	.052040	.020013	.143366	.011838	.025486	.018475	.193799
3.0	.029729	.043722	.015816	.106081	.009765	.018646	.012929	.127836
3.5	.025430	.028595	.008846	.050276	.006492	.009011	.005525	.046827
4.0	.022161	.018953	.004992	.024005	.004694	.004643	.002477	.017865
4.5	.019616	.012704	.002837	.011529	.003617	.002522	.001153	.007028
5.0	.017593	.008598	.001623	.005564	.002924	.001432	.000552	.002831
6.0	.014603	.004035	.000539	.001312	.002116	.000514	.000136	.000484
7.0	.012520	.001944	.000182	.000313	.001674	.000206	.000036	.000087
8.0	.010995	.000957	.000063	.000075	.001401	.000090	.000010	.000016
9.0	.009834	.000479	.000022	.000018	.001219	.000041	.000003	.000003
10.0	.008921	.000243	.000008	.000004	.001089	.000020	.000001	.000001

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
.1	1.432025	2.277564	3.384551	4.063295	1.086250	5.962076	5.920238	52.634540
.2	1.357881	2.037953	2.956011	3.388193	.840223	4.547532	4.505674	39.562400
.3	1.290025	1.828482	2.586756	2.834976	.654696	3.489340	3.447906	29.872790
.4	1.227795	1.644650	2.267714	2.379529	.513963	2.693662	2.653081	22.660490
.5	1.170603	1.482742	1.991359	2.002920	.406558	2.092188	2.052836	17.262200
.6	1.117936	1.339651	1.751412	1.690267	.324066	1.635025	1.597197	13.221510
.7	1.069339	1.212790	1.542607	1.429750	.260300	1.285599	1.249531	10.169120
.8	1.024411	1.099972	1.360523	1.211939	.210682	1.016994	.982838	7.856950
.9	.982791	.999364	1.201434	1.029280	.171814	.809322	.777169	6.097624
1.0	.944171	.909405	1.062181	.875668	.141161	.647829	.617718	4.752900
1.1	.908262	.828768	.940086	.746155	.116823	.521516	.493440	3.720469
1.2	.874817	.756323	.832865	.636708	.097368	.422147	.396069	2.924287
1.3	.843614	.691097	.738565	.544022	.081714	.343530	.319386	2.307605
1.4	.814451	.632249	.655518	.465380	.069035	.280981	.258691	1.827912
1.5	.787154	.579060	.582284	.398537	.058700	.230943	.210414	1.453214
1.6	.761559	.530899	.517630	.341633	.050222	.190699	.171832	1.159339
1.7	.737523	.487220	.460485	.293120	.043226	.158167	.140857	.927954
1.8	.714921	.447545	.409923	.251705	.037419	.131736	.115879	.745079
1.9	.693630	.411456	.365145	.216309	.032571	.110160	.095652	.600019
2.0	.673552	.378583	.325452	.186021	.028501	.092466	.079206	.484554
2.2	.636652	.321229	.258967	.137839	.022156	.065839	.054790	.318472
2.4	.603569	.273310	.206476	.102367	.017553	.047486	.038302	.211284
2.6	.573758	.233110	.164919	.076173	.014151	.034649	.027026	.141337
2.8	.546774	.199263	.131939	.056779	.011597	.025550	.019228	.095240
3.0	.522241	.170673	.105707	.042387	.009649	.019022	.013781	.064593
3.5	.469703	.116771	.061072	.020524	.006468	.009444	.006158	.025054
4.0	.426951	.080636	.035521	.010002	.004668	.004914	.002841	.009984
4.5	.391483	.056111	.020774	.004899	.003577	.002664	.001345	.004062
5.0	.361569	.039295	.012206	.002410	.002877	.001499	.000650	.001680
6.0	.313830	.019574	.004261	.000589	.002068	.000524	.000161	.000299
7.0	.277330	.009912	.001506	.000145	.001633	.000204	.000042	.000055
8.0	.248437	.005083	.000537	.000036	.001369	.000087	.000012	.000010
9.0	.224945	.002632	.000193	.000009	.001194	.000039	.000003	.000002
10.0	.205440	.001374	.000070	.000002	.001071	.000019	.000001	.000000

TABLE 15 A. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^4 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 0$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.151091	1.098641	0.916981	17.852259	1.912796	7.614168	7.296536	99.161728
0.2	0.137205	0.930014	0.765657	14.255917	1.417659	5.575433	5.335260	71.952751
0.3	0.124944	0.790520	0.641298	11.434841	1.056555	4.099798	3.916291	52.366695
0.4	0.114096	0.674659	0.538763	9.211051	0.792141	3.028226	2.886441	38.231525
0.5	0.104478	0.578041	0.453948	7.449685	0.597697	2.247367	2.136519	28.002577
0.6	0.095935	0.497149	0.383568	6.048118	0.454053	1.676241	1.588521	20.579409
0.7	0.088329	0.429154	0.324983	4.927927	0.347422	1.256879	1.186593	15.176559
0.8	0.081545	0.371779	0.276067	4.028804	0.267858	0.947676	0.890659	11.232125
0.9	0.075480	0.323176	0.235103	3.304191	0.208167	0.718692	0.671880	8.343287
1.0	0.070048	0.281852	0.200700	2.717973	0.163129	0.548336	0.509455	6.220623
1.1	0.065171	0.246586	0.171725	2.241992	0.128942	0.420983	0.388335	4.655631
1.2	0.060783	0.216383	0.147257	1.854180	0.102828	0.325295	0.297603	3.497801
1.3	0.056827	0.190425	0.126540	1.537182	0.082751	0.253020	0.229313	2.638155
1.4	0.053254	0.168040	0.108955	1.277273	0.067210	0.198130	0.177665	1.997574
1.5	0.050018	0.148674	0.093992	1.063563	0.055096	0.156206	0.138408	1.518469
1.6	0.047082	0.131866	0.081231	0.887364	0.045586	0.124000	0.108419	1.158796
1.7	0.044413	0.117234	0.070323	0.741726	0.038066	0.099111	0.085391	0.887760
1.8	0.041982	0.104460	0.060980	0.621066	0.032075	0.079759	0.067618	0.682742
1.9	0.039762	0.093275	0.052961	0.520877	0.027267	0.064619	0.053827	0.527069
2.0	0.037731	0.083456	0.046064	0.437513	0.023380	0.052702	0.043071	0.408413
2.2	0.034159	0.067189	0.034993	0.309970	0.017614	0.035737	0.027994	0.247914
2.4	0.031135	0.054468	0.026719	0.220714	0.013678	0.024831	0.018541	0.152601
2.6	0.028554	0.044431	0.020495	0.157862	0.010915	0.017648	0.012497	0.095174
2.8	0.026336	0.036448	0.015787	0.113357	0.008921	0.012804	0.008559	0.060090
3.0	0.024416	0.030052	0.012207	0.081690	0.007447	0.009465	0.005948	0.038373
3.5	0.020609	0.018913	0.006512	0.036498	0.005110	0.004764	0.002529	0.013068
4.0	0.017811	0.012179	0.003535	0.016567	0.003803	0.002593	0.001146	0.004694
4.5	0.015686	0.007989	0.001946	0.007617	0.002997	0.001495	0.000545	0.001760
5.0	0.014026	0.005320	0.001084	0.003539	0.002463	0.000901	0.000269	0.000684
6.0	0.011614	0.002444	0.000346	0.000783	0.001814	0.000358	0.000072	0.000112
7.0	0.009956	0.001164	0.000114	0.000178	0.001443	0.000154	0.000021	0.000020
8.0	0.008750	0.000569	0.000038	0.000041	0.001209	0.000070	0.000006	0.000004
9.0	0.007835	0.000284	0.000013	0.000010	0.001050	0.000033	0.000002	0.000001
10.0	0.007118	0.000144	0.000005	0.000002	0.000936	0.000016	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.685392	3.078394	4.908322	6.608734	0.981888	4.626752	4.638754	33.865219
0.2	1.576156	2.684584	4.197008	5.361443	0.750421	3.452336	3.456888	24.965544
0.3	1.477725	2.349701	3.598252	4.368064	0.577259	2.598371	2.587524	18.468620
0.4	1.388825	2.063755	3.092676	3.572986	0.447056	1.950307	1.945619	13.711001
0.5	1.308354	1.818601	2.664483	2.933600	0.348638	1.477155	1.469805	10.215858
0.6	1.235340	1.607600	2.300779	2.417069	0.273837	1.124789	1.115672	7.639718
0.7	1.168942	1.425301	1.990987	1.998004	0.216665	0.861209	0.850996	5.734509
0.8	1.108425	1.267222	1.726405	1.656620	0.172712	0.663133	0.652321	4.320612
0.9	1.053142	1.129656	1.499859	1.377449	0.138721	0.513568	0.502528	3.267618
1.0	1.002529	1.009535	1.305405	1.148329	0.112274	0.400078	0.389075	2.480596
1.1	0.956086	0.904307	1.138106	0.959654	0.091570	0.313524	0.302748	1.890231
1.2	0.913381	0.811837	0.993850	0.803787	0.075259	0.247171	0.236754	1.445762
1.3	0.874028	0.730337	0.869203	0.674647	0.062330	0.196034	0.186064	1.109903
1.4	0.837686	0.658301	0.761280	0.567354	0.052016	0.156412	0.146942	0.855181
1.5	0.804056	0.594459	0.667661	0.477984	0.043737	0.125544	0.116606	0.661284
1.6	0.772871	0.537735	0.586304	0.403364	0.037048	0.101365	0.092969	0.513149
1.7	0.743899	0.487212	0.515483	0.340923	0.031611	0.082320	0.074465	0.399568
1.8	0.716931	0.442110	0.453733	0.288565	0.027163	0.067238	0.059911	0.312168
1.9	0.691781	0.401760	0.399809	0.244576	0.023503	0.055227	0.048411	0.244680
2.0	0.668280	0.365585	0.352652	0.207553	0.020473	0.045610	0.039283	0.192386
2.2	0.625662	0.303852	0.275146	0.149986	0.015835	0.031603	0.026178	0.120019
2.4	0.588074	0.253692	0.215415	0.108832	0.012544	0.022339	0.017709	0.075726
2.6	0.554709	0.212674	0.169175	0.079255	0.010158	0.016086	0.012146	0.048283
2.8	0.524916	0.178937	0.133231	0.057901	0.008392	0.011783	0.008437	0.031084
3.0	0.498163	0.151044	0.105189	0.042421	0.007058	0.008767	0.005929	0.020189
3.5	0.441907	0.100107	0.058823	0.019697	0.004892	0.004445	0.002565	0.007103
4.0	0.397133	0.067324	0.033273	0.009259	0.003655	0.002419	0.001170	0.002605
4.5	0.360637	0.045812	0.018996	0.004395	0.002886	0.001391	0.000557	0.000989
5.0	0.330293	0.031474	0.010929	0.002103	0.002375	0.000834	0.000275	0.000386
6.0	0.282663	0.015199	0.003684	0.000491	0.001754	0.000330	0.000072	0.000063
7.0	0.246901	0.007512	0.001266	0.000117	0.001400	0.000142	0.000021	0.000011
8.0	0.219009	0.003778	0.000441	0.000028	0.001177	0.000064	0.000006	0.000002
9.0	0.196621	0.001926	0.000156	0.000007	0.001026	0.000030	0.000002	0.000000
10.0	0.178244	0.000993	0.000055	0.000002	0.000918	0.000015	0.000001	0.000000

TABLE 15 B. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\text{Sin}^4\ \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 15$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.141249	0.994987	0.818743	16.715986	1.923925	7.936193	7.624091	106.643364
0.2	0.128700	0.848908	0.6886.6	13.423070	1.427890	5.821327	5.584041	77.472252
0.3	0.117586	0.727059	0.580831	10.824770	1.065832	4.288581	4.106179	56.454971
0.4	0.107724	0.625026	0.491264	8.764715	0.800477	3.173962	3.032113	41.272068
0.5	0.098955	0.539255	0.416613	7.123784	0.605143	2.360494	2.248835	30.273476
0.6	0.091141	0.466881	0.354210	5.810897	0.460676	1.764545	1.675549	22.282738
0.7	0.084164	0.405581	0.301892	4.755981	0.353299	1.326190	1.254370	16.459732
0.8	0.077923	0.353471	0.257907	3.904907	0.273067	1.002378	0.943699	12.203023
0.9	0.072327	0.309014	0.220825	3.215631	0.212784	0.762102	0.713591	9.081151
1.0	0.067299	0.270952	0.189480	2.655353	0.167221	0.582971	0.542411	6.783848
1.1	0.062773	0.238254	0.162918	2.198369	0.132574	0.448764	0.414496	5.087434
1.2	0.058689	0.210070	0.140352	1.824423	0.106056	0.347694	0.318463	3.830279
1.3	0.054998	0.185701	0.121137	1.517495	0.085624	0.271173	0.246020	2.895238
1.4	0.051653	0.164564	0.104738	1.264852	0.069773	0.212914	0.191101	2.197190
1.5	0.048617	0.146175	0.090711	1.056339	0.057388	0.168306	0.149259	1.674094
1.6	0.045855	0.130131	0.078689	0.883813	0.047640	0.133949	0.117216	1.280603
1.7	0.043337	0.116095	0.068364	0.740728	0.039911	0.107328	0.092550	0.983451
1.8	0.041038	0.103782	0.059480	0.621802	0.033738	0.086576	0.073464	0.758207
1.9	0.038934	0.092953	0.051822	0.522749	0.028769	0.070300	0.058618	0.586787
2.0	0.037004	0.083406	0.045209	0.440091	0.024740	0.057454	0.047011	0.455830
2.2	0.033599	0.067498	0.034534	0.313125	0.018740	0.039103	0.030682	0.278093
2.4	0.030703	0.054968	0.026499	0.223827	0.014620	0.027251	0.020396	0.172033
2.6	0.028223	0.045019	0.020418	0.160656	0.011710	0.019412	0.013791	0.107818
2.8	0.026083	0.037062	0.015791	0.115739	0.009601	0.014106	0.009470	0.068395
3.0	0.024224	0.030654	0.012255	0.083656	0.008033	0.010437	0.006595	0.043873
3.5	0.020521	0.019414	0.006587	0.037621	0.005532	0.005256	0.002813	0.015094
4.0	0.017781	0.012562	0.003598	0.017170	0.004123	0.002857	0.001276	0.005467
4.5	0.015690	0.008270	0.001991	0.007931	0.003250	0.001644	0.000607	0.002063
5.0	0.014051	0.005523	0.001113	0.003699	0.002669	0.000988	0.000299	0.000806
6.0	0.011658	0.002547	0.000358	0.000824	0.001962	0.000391	0.000079	0.000133
7.0	0.010006	0.001216	0.000118	0.000188	0.001557	0.000168	0.000023	0.000024
8.0	0.008801	0.000595	0.000040	0.000044	0.001300	0.000076	0.000007	0.000005
9.0	0.007885	0.000297	0.000014	0.000010	0.001126	0.000036	0.000002	0.000001
10.0	0.007165	0.000151	0.000005	0.000002	0.001001	0.000017	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.565452	2.758240	4.330273	6.055301	0.957651	4.613540	4.622008	35.232994
0.2	1.467371	2.419894	3.722719	4.939718	0.733800	3.456588	3.458261	26.032505
0.3	1.378784	2.130182	3.208066	4.045737	0.566078	2.602652	2.599381	19.303762
0.4	1.298593	1.881141	2.770837	3.325916	0.439751	1.969793	1.962999	14.366891
0.5	1.225835	1.666242	2.398342	2.743693	0.344080	1.498773	1.489555	10.732621
0.6	1.159675	1.480117	2.080146	2.270739	0.271217	1.146640	1.135834	8.048138
0.7	1.099378	1.318339	1.807644	1.884974	0.215398	0.882173	0.870411	6.058262
0.8	1.044303	1.177241	1.573692	1.569126	0.172380	0.682597	0.670353	4.577983
0.9	0.993885	1.053774	1.372372	1.309588	0.139022	0.531248	0.518875	3.472783
1.0	0.947631	0.945392	1.198745	1.095604	0.112994	0.415891	0.403645	2.644580
1.1	0.905106	0.849965	1.048687	0.918624	0.092556	0.327513	0.315575	2.021628
1.2	0.865925	0.765701	0.918736	0.771820	0.076404	0.259447	0.247944	1.551301
1.3	0.829751	0.691093	0.805982	0.649714	0.063557	0.206744	0.195759	1.194869
1.4	0.796287	0.624860	0.707973	0.547894	0.053272	0.165715	0.155299	0.923731
1.5	0.765263	0.565918	0.622637	0.462789	0.044987	0.133602	0.123781	0.716707
1.6	0.736449	0.513339	0.548212	0.391499	0.038268	0.108329	0.099111	0.558048
1.7	0.709635	0.466334	0.483204	0.331660	0.032786	0.088331	0.079711	0.436008
1.8	0.684635	0.424221	0.426340	0.281337	0.028284	0.072421	0.064385	0.341798
1.9	0.661284	0.386417	0.376530	0.238943	0.024566	0.059696	0.052222	0.268812
2.0	0.639436	0.352417	0.332843	0.203169	0.021475	0.049463	0.042527	0.212073
2.2	0.599730	0.294135	0.260750	0.147349	0.016718	0.034472	0.028527	0.133180
2.4	0.564619	0.246515	0.204907	0.107267	0.013318	0.024482	0.019409	0.084574
2.6	0.533380	0.207376	0.161475	0.078347	0.010835	0.017695	0.013379	0.054261
2.8	0.505425	0.175035	0.127571	0.057392	0.008985	0.012997	0.009332	0.035142
3.0	0.480272	0.148184	0.101016	0.042152	0.007579	0.009689	0.006581	0.022956
3.5	0.427221	0.098842	0.056857	0.019677	0.005279	0.004922	0.002865	0.008182
4.0	0.384837	0.066829	0.032339	0.009291	0.003952	0.002676	0.001311	0.003034
4.5	0.350181	0.045681	0.018552	0.004427	0.003122	0.001514	0.000624	0.001162
5.0	0.321290	0.031506	0.010718	0.002125	0.002568	0.000918	0.000308	0.000457
6.0	0.275791	0.015309	0.003639	0.000499	0.001892	0.000361	0.000081	0.000076
7.0	0.241499	0.007602	0.001258	0.000119	0.001506	0.000154	0.000023	0.000013
8.0	0.214668	0.003837	0.000440	0.000029	0.001262	0.000070	0.000007	0.000003
9.0	0.193071	0.001962	0.000156	0.000007	0.001097	0.000033	0.000002	0.000000
10.0	0.175300	0.001013	0.000056	0.000002	0.000979	0.000016	0.000001	0.000000

TABLE 15 C. CRRES Omnidirectional Geometric Factors for Power Law Spectra Sin^4 α Pitch Angle Path Length Distribution Computation, λ = 30

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.133255	0.947927	0.773826	15.748132	1.983463	8.694572	8.372795	124.867523
0.2	0.121973	0.813533	0.653835	12.722056	1.473942	6.388861	6.142216	90.894936
0.3	0.111939	0.700851	0.554021	10.320780	1.101764	4.715720	4.524493	66.381271
0.4	0.102996	0.605992	0.470728	8.405972	0.828762	3.497344	3.347303	48.643467
0.5	0.095010	0.525820	0.401002	6.871926	0.627606	2.606816	2.487642	35.770924
0.6	0.087864	0.457799	0.342457	5.637397	0.478677	1.953338	1.857512	26.400600
0.7	0.081456	0.399867	0.293155	4.639704	0.367854	1.471808	1.393810	19.557920
0.8	0.075699	0.350346	0.251520	3.830149	0.284937	1.115412	1.051176	14.544515
0.9	0.070516	0.307863	0.216264	3.170760	0.222547	0.850405	0.796906	10.858759
1.0	0.065840	0.271290	0.186330	2.631767	0.175319	0.652393	0.607367	8.139448
1.1	0.061613	0.239699	0.160852	2.189712	0.139341	0.503684	0.465423	6.125866
1.2	0.057785	0.212323	0.139113	1.826022	0.111755	0.391412	0.358612	4.629285
1.3	0.054310	0.188526	0.120523	1.525934	0.090458	0.306182	0.277842	3.512711
1.4	0.051150	0.167777	0.104590	1.277638	0.073901	0.241114	0.216456	2.676418
1.5	0.048271	0.149635	0.090905	1.071684	0.060936	0.191149	0.169561	2.047579
1.6	0.045642	0.133728	0.079129	0.900441	0.050708	0.152554	0.133550	1.572857
1.7	0.043237	0.119745	0.068975	0.757745	0.042579	0.122561	0.105753	1.213043
1.8	0.041033	0.107421	0.060205	0.638593	0.036070	0.099110	0.084182	0.939238
1.9	0.039009	0.096534	0.052616	0.538909	0.030819	0.080662	0.067355	0.730049
2.0	0.037147	0.086894	0.046039	0.455363	0.026550	0.066059	0.054160	0.569592
2.2	0.033847	0.070733	0.035368	0.326256	0.020171	0.045113	0.035522	0.350524
2.4	0.031024	0.057905	0.027282	0.234734	0.015771	0.031515	0.023716	0.218696
2.6	0.028592	0.047648	0.021123	0.169511	0.012650	0.022480	0.016094	0.138199
2.8	0.026484	0.039391	0.016410	0.122814	0.010380	0.016342	0.011084	0.088361
3.0	0.024646	0.032703	0.012788	0.089242	0.008687	0.012086	0.007736	0.057105
3.5	0.020958	0.020872	0.006936	0.040614	0.005978	0.006061	0.003309	0.019970
4.0	0.018208	0.013584	0.003816	0.018726	0.004447	0.003273	0.001500	0.007327
4.5	0.016096	0.008982	0.002125	0.008725	0.003499	0.001870	0.000711	0.002792
5.0	0.014433	0.006018	0.001194	0.004101	0.002869	0.001116	0.000349	0.001097
6.0	0.011995	0.002788	0.000387	0.000925	0.002102	0.000437	0.000091	0.000182
7.0	0.010304	0.001335	0.000128	0.000213	0.001665	0.000186	0.000026	0.000032
8.0	0.009067	0.000654	0.000043	0.000050	0.001388	0.000084	0.000008	0.000006
9.0	0.008125	0.000327	0.000015	0.000012	0.001200	0.000040	0.000002	0.000001
10.0	0.007384	0.000166	0.000005	0.000003	0.001065	0.000019	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.463058	2.603448	4.058276	5.633063	0.953323	4.800353	4.802982	38.683441
0.2	1.375719	2.293494	3.499720	4.615523	0.732730	3.612455	3.608411	28.702169
0.3	1.296571	2.027019	3.025070	3.796585	0.567133	2.732803	2.724035	21.378239
0.4	1.224682	1.797027	2.620547	3.134361	0.442141	2.078566	2.066568	15.985600
0.5	1.159244	1.597756	2.274836	2.596323	0.347261	1.589770	1.575675	12.000829
0.6	1.099548	1.424473	1.979598	2.157408	0.274814	1.222855	1.207515	9.045610
0.7	1.044968	1.273254	1.724418	1.797884	0.219160	0.946082	0.930134	6.845716
0.8	0.994962	1.140842	1.504970	1.502283	0.176140	0.736257	0.720165	5.201855
0.9	0.949048	1.024527	1.315829	1.258382	0.142675	0.576361	0.560464	3.968731
1.0	0.906802	0.922033	1.152229	1.056481	0.116474	0.453871	0.438408	3.040098
1.1	0.867849	0.831456	1.010430	0.888840	0.095826	0.359533	0.344666	2.338015
1.2	0.831862	0.751186	0.886288	0.749250	0.079448	0.286480	0.272314	1.805114
1.3	0.798549	0.679860	0.780151	0.632712	0.066370	0.229601	0.216198	1.399034
1.4	0.767648	0.616327	0.686777	0.535185	0.055859	0.185069	0.172461	1.088380
1.5	0.738931	0.559600	0.605266	0.453384	0.047357	0.150015	0.138206	0.849805
1.6	0.712196	0.508835	0.533999	0.384630	0.040434	0.122268	0.111250	0.665884
1.7	0.687259	0.463309	0.471599	0.326730	0.034762	0.100186	0.089938	0.523562
1.8	0.663957	0.422403	0.416887	0.277885	0.030086	0.082520	0.073009	0.413026
1.9	0.642145	0.385575	0.368853	0.236610	0.026207	0.068311	0.059503	0.326866
2.0	0.621695	0.352361	0.326630	0.201678	0.022970	0.056824	0.048681	0.259473
2.2	0.584424	0.295207	0.256737	0.146947	0.017961	0.039869	0.032935	0.164932
2.4	0.551349	0.248278	0.202382	0.107438	0.014356	0.028464	0.022580	0.105968
2.6	0.521823	0.209531	0.159948	0.078789	0.011707	0.020649	0.015668	0.068751
2.8	0.495322	0.177380	0.126707	0.057934	0.009721	0.015203	0.010991	0.045002
3.0	0.471412	0.150583	0.100587	0.042701	0.008206	0.011346	0.007788	0.029693
3.5	0.420777	0.101052	0.056938	0.020093	0.005713	0.005753	0.003417	0.010823
4.0	0.380121	0.068675	0.032544	0.009553	0.004268	0.003108	0.001569	0.004089
4.5	0.346739	0.047149	0.018749	0.004580	0.003363	0.001768	0.000747	0.001590
5.0	0.318815	0.032643	0.010872	0.002210	0.002760	0.001048	0.000367	0.000633
6.0	0.274658	0.015962	0.003715	0.000523	0.002027	0.000406	0.000095	0.000106
7.0	0.241224	0.007967	0.001290	0.000126	0.001609	0.000172	0.000027	0.000019
8.0	0.214963	0.004038	0.000454	0.000031	0.001346	0.000077	0.000008	0.000004
9.0	0.193755	0.002071	0.000161	0.000008	0.001168	0.000036	0.000002	0.000001
10.0	0.176251	0.001073	0.000058	0.000002	0.001040	0.000018	0.000001	0.000000

TABLE 15 D. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^4 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 45$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.129832	0.909705	0.737103	14.553537	2.073612	9.679792	9.391701	148.930618
0.2	0.119307	0.786419	0.626468	11.853591	1.542144	7.123003	6.898727	108.618164
0.3	0.109909	0.682320	0.533904	9.693679	1.153755	5.265776	5.089017	79.488464
0.4	0.101502	0.594065	0.456210	7.957291	0.868714	3.911822	3.770783	58.377689
0.5	0.093965	0.518945	0.390794	6.554893	0.658564	2.920976	2.807031	43.031731
0.6	0.087195	0.454758	0.335548	5.417212	0.502871	2.192905	2.099732	31.840456
0.7	0.081102	0.399708	0.288757	4.490498	0.386926	1.655619	1.578544	23.651913
0.8	0.075607	0.352322	0.249018	3.732665	0.300107	1.257323	1.192867	17.639715
0.9	0.070641	0.311393	0.215176	3.110698	0.234718	0.960657	0.906208	13.209554
1.0	0.066145	0.275922	0.186285	2.598511	0.185170	0.738585	0.692162	9.933105
1.1	0.062067	0.245082	0.161561	2.175398	0.147384	0.571487	0.531580	7.500679
1.2	0.058359	0.218185	0.140354	1.824852	0.118376	0.445075	0.410514	5.687820
1.3	0.054983	0.194660	0.122124	1.533644	0.095953	0.348908	0.318783	4.331365
1.4	0.051902	0.174026	0.106421	1.291119	0.078497	0.275330	0.248920	3.312313
1.5	0.049085	0.155878	0.092868	1.088674	0.064808	0.218705	0.195436	2.543612
1.6	0.046505	0.139878	0.081149	0.919320	0.053994	0.174866	0.154274	1.961387
1.7	0.044138	0.125737	0.070998	0.777370	0.045388	0.140721	0.122429	1.518580
1.8	0.041961	0.113209	0.062191	0.658169	0.038485	0.113964	0.097661	1.180427
1.9	0.039957	0.102087	0.054538	0.557902	0.032908	0.092869	0.078296	0.921138
2.0	0.038108	0.092193	0.047877	0.473426	0.028368	0.076136	0.063077	0.721520
2.2	0.034817	0.075497	0.037007	0.341935	0.021570	0.052066	0.041510	0.447507
2.4	0.031989	0.062136	0.028708	0.247850	0.016869	0.036385	0.027792	0.281349
2.6	0.029541	0.051371	0.022343	0.180219	0.013528	0.025937	0.018900	0.179106
2.8	0.027410	0.042648	0.017441	0.131409	0.011093	0.018827	0.013037	0.115324
3.0	0.025544	0.035538	0.013651	0.096058	0.009276	0.013891	0.009107	0.075025
3.5	0.021781	0.022855	0.007476	0.044295	0.006365	0.006908	0.003895	0.026623
4.0	0.018956	0.014958	0.004145	0.020653	0.004722	0.003691	0.001759	0.009883
4.5	0.016777	0.009933	0.002322	0.009715	0.003707	0.002086	0.000829	0.003800
5.0	0.015054	0.006676	0.001312	0.004604	0.003034	0.001232	0.000405	0.001502
6.0	0.012521	0.003106	0.000428	0.001053	0.002220	0.000474	0.000104	0.000250
7.0	0.010759	0.001490	0.000143	0.000245	0.001757	0.000200	0.000029	0.000045
8.0	0.009468	0.000731	0.000049	0.000058	0.001464	0.000090	0.000009	0.000008
9.0	0.008483	0.000366	0.000017	0.000014	0.001265	0.000042	0.000003	0.000002
10.0	0.007709	0.000186	0.000006	0.000003	0.001123	0.000020	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.413145	2.469136	3.823288	5.115229	0.970583	5.086353	5.103700	43.110897
0.2	1.332360	2.186517	3.310441	4.216977	0.747797	3.844693	3.850597	32.129581
0.3	1.258934	1.942184	2.872723	3.489485	0.580291	2.922100	2.919822	24.043293
0.4	1.192046	1.730129	2.498063	2.897495	0.453642	2.233425	2.225420	18.066822
0.5	1.130980	1.545400	2.176508	2.413614	0.357321	1.716891	1.705000	13.632898
0.6	1.075114	1.383902	1.899822	2.016446	0.283622	1.327545	1.313142	10.330594
0.7	1.023894	1.242229	1.661158	1.689174	0.226881	1.032569	1.016668	7.861322
0.8	0.976836	1.117542	1.454817	1.418522	0.182917	0.807913	0.791264	6.007494
0.9	0.933512	1.007470	1.276036	1.193943	0.148629	0.635900	0.619039	4.610052
1.0	0.893547	0.910010	1.120812	1.007014	0.121713	0.503472	0.486788	3.552296
1.1	0.856605	0.823480	0.985777	0.850974	0.100442	0.400959	0.384722	2.748366
1.2	0.822391	0.746453	0.868094	0.720378	0.083520	0.321162	0.305554	2.134843
1.3	0.790642	0.677716	0.765355	0.610808	0.069968	0.258704	0.243840	1.664717
1.4	0.761126	0.616231	0.675516	0.518673	0.059044	0.209544	0.195494	1.303017
1.5	0.733637	0.561112	0.596840	0.441038	0.050179	0.170640	0.157435	1.023628
1.6	0.707986	0.511599	0.527838	0.375498	0.042940	0.139685	0.127332	0.806976
1.7	0.684012	0.467035	0.467240	0.320070	0.036991	0.114922	0.103411	0.638336
1.8	0.661568	0.426850	0.413956	0.273119	0.032072	0.095010	0.084315	0.506579
1.9	0.640519	0.390550	0.367045	0.233288	0.027980	0.078917	0.069004	0.403266
2.0	0.620748	0.357708	0.325701	0.199451	0.024556	0.065845	0.056677	0.321977
2.2	0.584623	0.300939	0.257005	0.146160	0.019237	0.046429	0.038621	0.206971
2.4	0.552463	0.254064	0.203324	0.107430	0.015390	0.033262	0.026644	0.134410
2.6	0.523672	0.215161	0.161232	0.079172	0.012553	0.024181	0.018585	0.088094
2.8	0.497762	0.182728	0.128122	0.058484	0.010420	0.017817	0.013095	0.058218
3.0	0.474332	0.155579	0.102006	0.043291	0.008788	0.013291	0.009309	0.038760
3.5	0.424534	0.105076	0.058114	0.020565	0.006098	0.006703	0.004105	0.014413
4.0	0.384378	0.071790	0.033399	0.009858	0.004539	0.003587	0.001885	0.005536
4.5	0.351297	0.049511	0.019333	0.004759	0.003565	0.002017	0.000895	0.002182
5.0	0.323547	0.034412	0.011258	0.002311	0.002915	0.001182	0.000437	0.000878
6.0	0.279524	0.016934	0.003873	0.000553	0.002137	0.000448	0.000112	0.000149
7.0	0.246072	0.008494	0.001353	0.000134	0.001695	0.000187	0.000031	0.000027
8.0	0.219721	0.004323	0.000478	0.000033	0.001417	0.000083	0.000009	0.000005
9.0	0.198386	0.002225	0.000171	0.000008	0.001229	0.000039	0.000003	0.000001
10.0	0.180738	0.001155	0.000061	0.000002	0.001095	0.000019	0.000001	0.000000

TABLE 15 E. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^4 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 60$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.129729	0.886414	0.708282	13.498644	2.174954	10.637485	10.354649	171.600296
0.2	0.119595	0.771057	0.605250	11.075621	1.617794	7.834941	7.612566	125.319565
0.3	0.110516	0.673044	0.518561	9.122497	1.210593	5.797883	5.620873	91.844582
0.4	0.102365	0.589428	0.445391	7.540480	0.911706	4.311764	4.169116	67.558784
0.5	0.095033	0.517812	0.383438	6.253204	0.691313	3.223341	3.106978	49.883976
0.6	0.088425	0.456241	0.330831	5.201301	0.528001	2.422869	2.326843	36.977970
0.7	0.082458	0.403110	0.286034	4.338300	0.406354	1.831589	1.751482	27.521654
0.8	0.077059	0.357102	0.247785	3.627654	0.315242	1.392818	1.325308	20.568241
0.9	0.072164	0.317128	0.215045	3.040464	0.246600	1.065636	1.008219	15.436259
1.0	0.067718	0.282285	0.186952	2.553746	0.194570	0.820431	0.771190	11.634176
1.1	0.063673	0.251822	0.162793	2.149128	0.154877	0.635689	0.593149	8.806300
1.2	0.059984	0.225110	0.141971	1.811859	0.124394	0.495745	0.458751	6.694588
1.3	0.056615	0.201624	0.123989	1.530029	0.100822	0.389135	0.356782	5.111233
1.4	0.053532	0.180919	0.108431	1.293993	0.082463	0.307452	0.279015	3.919113
1.5	0.050706	0.162621	0.094944	1.095893	0.068061	0.244497	0.219393	3.017808
1.6	0.048110	0.146412	0.083234	0.929312	0.056679	0.195686	0.173441	2.333509
1.7	0.045722	0.132022	0.073050	0.788988	0.047616	0.157612	0.137835	1.811788
1.8	0.043521	0.119220	0.064180	0.670587	0.040346	0.127735	0.110100	1.412352
1.9	0.041490	0.107808	0.056443	0.570533	0.034470	0.104147	0.088382	1.105272
2.0	0.039611	0.097615	0.049685	0.485867	0.029686	0.085412	0.071288	0.868226
2.2	0.036258	0.080323	0.038601	0.353271	0.022521	0.058415	0.047013	0.541559
2.4	0.033363	0.066390	0.030086	0.257652	0.017566	0.040794	0.031528	0.342372
2.6	0.030849	0.055097	0.023516	0.188420	0.014046	0.029036	0.021468	0.219121
2.8	0.028653	0.045894	0.018429	0.138120	0.011484	0.021029	0.014818	0.141810
3.0	0.026725	0.038358	0.014477	0.101463	0.009574	0.015471	0.010354	0.092700
3.5	0.022820	0.024817	0.007989	0.047303	0.006525	0.007621	0.004422	0.033247
4.0	0.019876	0.016315	0.004458	0.022261	0.004813	0.004027	0.001990	0.012448
4.5	0.017597	0.010869	0.002510	0.010556	0.003764	0.002249	0.000933	0.004818
5.0	0.015791	0.007323	0.001425	0.005037	0.003073	0.001314	0.000452	0.001914
6.0	0.013130	0.003417	0.000468	0.001165	0.002243	0.000497	0.000115	0.000321
7.0	0.011278	0.001642	0.000157	0.000274	0.001775	0.000207	0.000032	0.000057
8.0	0.009920	0.000807	0.000053	0.000065	0.001481	0.000092	0.000009	0.000011
9.0	0.008885	0.000403	0.000018	0.000016	0.001281	0.000043	0.000003	0.000002
10.0	0.008070	0.000205	0.000006	0.000004	0.001139	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.401925	2.380196	3.634958	4.665185	1.001261	5.381369	5.394440	47.031857
0.2	1.324757	2.117160	3.159377	3.867864	0.772664	4.081845	4.083749	35.173164
0.3	1.254424	1.888631	2.751717	3.218203	0.600593	3.113673	3.107594	26.416788
0.4	1.190180	1.689327	2.401316	2.686382	0.470329	2.388894	2.377261	19.926260
0.5	1.131376	1.514866	2.099343	2.249138	0.371123	1.843612	1.828257	15.095930
0.6	1.077438	1.361634	1.838467	1.888193	0.295107	1.431266	1.413557	11.486538
0.7	1.027861	1.226595	1.612561	1.589118	0.236490	1.117791	1.098757	8.778293
0.8	0.982201	1.107219	1.416515	1.340454	0.190996	0.878196	0.858585	6.737639
0.9	0.940064	1.001381	1.246030	1.133043	0.155454	0.694055	0.674416	5.193513
1.0	0.901103	0.907283	1.097486	0.959540	0.127502	0.551749	0.532470	4.020123
1.1	0.865008	0.823401	0.967822	0.814010	0.105372	0.441155	0.422504	3.124669
1.2	0.831505	0.748443	0.854448	0.691645	0.087733	0.354723	0.336881	2.438425
1.3	0.800354	0.681303	0.755156	0.588526	0.073580	0.286798	0.269874	1.910316
1.4	0.771335	0.621035	0.668068	0.501445	0.062149	0.233121	0.217177	1.502223
1.5	0.744255	0.566824	0.591575	0.427770	0.052857	0.190470	0.175531	1.185596
1.6	0.718941	0.517967	0.524301	0.365329	0.045254	0.156399	0.142463	0.938971
1.7	0.695240	0.473856	0.465061	0.312325	0.038996	0.129038	0.116084	0.746130
1.8	0.673013	0.433962	0.412834	0.267266	0.033812	0.106955	0.094948	0.594781
1.9	0.652133	0.397823	0.366742	0.228910	0.029493	0.089042	0.077940	0.475571
2.0	0.632491	0.365037	0.326019	0.196219	0.025875	0.074442	0.064197	0.381351
2.2	0.596525	0.308152	0.258132	0.144497	0.020244	0.052656	0.043969	0.247196
2.4	0.564421	0.260959	0.204858	0.106690	0.016164	0.037798	0.030465	0.161814
2.6	0.535612	0.221624	0.162919	0.078957	0.013151	0.027502	0.021328	0.106856
2.8	0.509628	0.188703	0.129812	0.058552	0.010885	0.020260	0.015071	0.071118
3.0	0.486083	0.161045	0.103610	0.043499	0.009152	0.015096	0.010739	0.047664
3.5	0.435904	0.109326	0.059355	0.020831	0.006300	0.007564	0.004749	0.017987
4.0	0.395302	0.075010	0.034272	0.010055	0.004656	0.004007	0.002181	0.006995
4.5	0.361763	0.051915	0.019918	0.004883	0.003637	0.002226	0.001032	0.002785
5.0	0.333570	0.036191	0.011639	0.002384	0.002966	0.001288	0.000502	0.001130
6.0	0.288735	0.017897	0.004027	0.000575	0.002163	0.000477	0.000126	0.000194
7.0	0.254577	0.009011	0.001413	0.000140	0.001714	0.000195	0.000034	0.000035
8.0	0.227613	0.004600	0.000501	0.000035	0.001433	0.000086	0.000010	0.000007
9.0	0.205742	0.002373	0.000179	0.000009	0.001244	0.000040	0.000003	0.000001
10.0	0.187620	0.001235	0.000065	0.000002	0.001110	0.000019	0.000001	0.000000

TABLE 15 F. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^4 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 75$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.131952	0.880959	0.694391	12.841805	2.273010	11.390688	11.101196	187.174301
0.2	0.121884	0.769269	0.595337	10.583829	1.690629	8.393844	8.165581	136.802444
0.3	0.112844	0.674005	0.511712	8.755233	1.265016	6.214825	6.032595	100.347511
0.4	0.104711	0.592416	0.440887	7.267242	0.952624	4.624549	4.477254	73.883156
0.5	0.097380	0.522265	0.380720	6.050993	0.722279	3.459349	3.338852	54.609509
0.6	0.090758	0.461719	0.329459	5.052683	0.551595	2.602010	2.502312	40.525570
0.7	0.084765	0.409273	0.285665	4.230093	0.424458	1.968403	1.885025	30.197636
0.8	0.079332	0.363688	0.248152	3.549858	0.329231	1.497949	1.427538	22.596479
0.9	0.074397	0.323935	0.215940	2.985484	0.257488	1.146933	1.086934	16.981058
1.0	0.069905	0.289159	0.188216	2.515826	0.203106	0.883689	0.832156	12.816467
1.1	0.065809	0.258647	0.164301	2.123896	0.161618	0.685220	0.640643	9.715529
1.2	0.062068	0.231803	0.143630	1.795998	0.129754	0.534764	0.495964	7.397155
1.3	0.058644	0.208121	0.125727	1.521024	0.105114	0.420059	0.386104	5.656660
1.4	0.055505	0.187179	0.110194	1.289945	0.085923	0.332102	0.302244	4.344479
1.5	0.052622	0.168614	0.096693	1.095365	0.070867	0.264257	0.237894	3.351022
1.6	0.049971	0.152120	0.084941	0.931228	0.058969	0.211611	0.188250	2.595656
1.7	0.047527	0.137436	0.074694	0.792546	0.049496	0.170514	0.149747	2.018875
1.8	0.045271	0.124337	0.065748	0.675191	0.041897	0.138236	0.119726	1.576592
1.9	0.043186	0.112630	0.057926	0.575743	0.035757	0.112734	0.096194	1.236022
2.0	0.041255	0.102148	0.051079	0.491364	0.030758	0.092465	0.077655	0.972690
2.2	0.037801	0.084305	0.039814	0.358728	0.023274	0.063229	0.051289	0.608907
2.4	0.034812	0.069867	0.031124	0.262623	0.018103	0.044126	0.034440	0.386320
2.6	0.032211	0.058120	0.024395	0.192731	0.014434	0.031371	0.023473	0.248106
2.8	0.029934	0.048513	0.019167	0.141743	0.011766	0.022682	0.016214	0.161105
3.0	0.027931	0.040622	0.015092	0.104443	0.009782	0.016652	0.011334	0.105651
3.5	0.023864	0.026381	0.008371	0.049025	0.006623	0.008147	0.004839	0.038169
4.0	0.020789	0.017390	0.004691	0.023206	0.004862	0.004269	0.002174	0.014380
4.5	0.018404	0.011609	0.002651	0.011060	0.003789	0.002364	0.001016	0.005594
5.0	0.016512	0.007833	0.001509	0.005301	0.003087	0.001370	0.000490	0.002232
6.0	0.013723	0.003661	0.000497	0.001234	0.002250	0.000511	0.000123	0.000376
7.0	0.011781	0.001761	0.000167	0.000292	0.001781	0.000211	0.000033	0.000067
8.0	0.010357	0.000865	0.000057	0.000070	0.001487	0.000094	0.000010	0.000012
9.0	0.009273	0.000433	0.000020	0.000017	0.001289	0.000044	0.000003	0.000002
10.0	0.008420	0.000220	0.000007	0.000004	0.001147	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.419316	2.348796	3.539311	4.393908	1.037290	5.630347	5.622173	49.545372
0.2	1.343042	2.094949	3.083252	3.655261	0.801168	4.279765	4.265288	37.129948
0.3	1.273404	1.873735	2.691329	3.051230	0.623314	3.271919	3.253041	27.947756
0.4	1.209686	1.680224	2.353613	2.555004	0.488571	2.516116	2.494354	21.129648
0.5	1.151266	1.510338	2.061858	2.145594	0.385875	1.946439	1.922959	16.046150
0.6	1.097594	1.360689	1.809203	1.806475	0.307116	1.514789	1.490482	12.240123
0.7	1.048181	1.228436	1.589911	1.524552	0.246329	1.185957	1.161495	9.378380
0.8	1.002601	1.111200	1.399170	1.289397	0.199106	0.934071	0.909950	7.217363
0.9	0.960475	1.006982	1.232933	1.092651	0.162178	0.740049	0.716621	5.578417
1.0	0.921466	0.914081	1.087779	0.927575	0.133105	0.589753	0.567262	4.330018
1.1	0.885275	0.831061	0.960817	0.788714	0.110064	0.472670	0.451276	3.374964
1.2	0.851638	0.756695	0.849580	0.671636	0.091680	0.380945	0.360742	2.641199
1.3	0.820319	0.689931	0.751974	0.572709	0.076914	0.308682	0.289717	2.075043
1.4	0.791108	0.629868	0.666206	0.488958	0.064976	0.251437	0.233718	1.636395
1.5	0.763813	0.575725	0.590739	0.417925	0.055261	0.205841	0.189352	1.295146
1.6	0.738270	0.526832	0.524251	0.357585	0.047306	0.169329	0.154035	1.028615
1.7	0.714325	0.482601	0.465606	0.306248	0.040751	0.139941	0.125794	0.819637
1.8	0.691847	0.442525	0.413822	0.262514	0.035318	0.116167	0.103109	0.655174
1.9	0.670709	0.406156	0.368049	0.225207	0.030789	0.096840	0.084811	0.525279
2.0	0.650806	0.373106	0.327549	0.193348	0.026991	0.081056	0.069991	0.422331
2.2	0.614310	0.315627	0.259894	0.142805	0.021077	0.057436	0.048108	0.275175
2.4	0.581679	0.267801	0.206661	0.105730	0.016791	0.041274	0.033437	0.181020
2.6	0.552350	0.227830	0.164654	0.078447	0.013624	0.030042	0.023472	0.120101
2.8	0.525863	0.194294	0.131416	0.058312	0.011244	0.022125	0.016624	0.080289
3.0	0.501833	0.166058	0.105056	0.043416	0.009426	0.016471	0.011867	0.054037
3.5	0.450528	0.113082	0.060394	0.020895	0.006441	0.008216	0.005264	0.020587
4.0	0.408928	0.077787	0.034976	0.010128	0.004731	0.004321	0.002419	0.008071
4.5	0.374509	0.053953	0.020379	0.004937	0.003678	0.002380	0.001145	0.003236
5.0	0.345543	0.037681	0.011934	0.002418	0.002990	0.001364	0.000555	0.001321
6.0	0.299413	0.018688	0.004144	0.000586	0.002174	0.000496	0.000139	0.000229
7.0	0.264220	0.009431	0.001458	0.000144	0.001722	0.000201	0.000037	0.000042
8.0	0.236407	0.004823	0.000518	0.000036	0.001442	0.000088	0.000011	0.000008
9.0	0.213824	0.002492	0.000186	0.000009	0.001254	0.000041	0.000003	0.000002
10.0	0.195096	0.001298	0.000067	0.000002	0.001120	0.000019	0.000001	0.000000

TABLE 15 G. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\text{Sin}^4\ \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 90$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.136146	0.889822	0.700602	12.677100	2.361746	11.816578	11.481008	192.520721
0.2	0.125818	0.777873	0.601050	10.458866	1.756606	8.709689	8.446133	141.481247
0.3	0.116539	0.682295	0.516961	8.660847	1.314360	6.450328	6.240848	103.811821
0.4	0.108187	0.600357	0.445704	7.196378	0.989770	4.801142	4.632632	76.459831
0.5	0.100655	0.529832	0.385135	5.998183	0.750431	3.592546	3.455390	56.534920
0.6	0.093848	0.468900	0.333499	5.013719	0.573083	2.703098	2.590195	41.971092
0.7	0.087685	0.416063	0.289357	4.201713	0.440983	2.045604	1.951674	31.288242
0.8	0.082095	0.370088	0.251523	3.529549	0.342039	1.557291	1.478369	23.423323
0.9	0.077014	0.329952	0.219014	2.971298	0.267496	1.192841	1.125929	17.611038
1.0	0.072388	0.294803	0.191014	2.506263	0.210990	0.919442	0.862245	13.298853
1.1	0.068168	0.263931	0.166847	2.117792	0.167881	0.713245	0.663998	10.086718
1.2	0.064311	0.236741	0.145944	1.792462	0.134772	0.556877	0.514196	7.684182
1.3	0.060780	0.212730	0.127828	1.519373	0.109168	0.437618	0.400418	5.879645
1.4	0.057541	0.191474	0.112101	1.289652	0.089226	0.346133	0.313545	4.518535
1.5	0.054566	0.172613	0.098422	1.096034	0.073581	0.275537	0.246865	3.487491
1.6	0.051827	0.155840	0.086507	0.932556	0.061217	0.220732	0.195408	2.703130
1.7	0.049303	0.140894	0.076112	0.794302	0.051373	0.177931	0.155488	2.103869
1.8	0.046972	0.127549	0.067030	0.677206	0.043476	0.144301	0.124353	1.644083
1.9	0.044816	0.115611	0.059086	0.577892	0.037095	0.117718	0.099941	1.289813
2.0	0.042819	0.104914	0.052127	0.493555	0.031901	0.096580	0.080701	1.015720
2.2	0.039244	0.086683	0.040669	0.360827	0.024124	0.066073	0.053328	0.636724
2.4	0.036149	0.071909	0.031820	0.264503	0.018751	0.046123	0.035824	0.404520
2.6	0.033454	0.059871	0.024961	0.194350	0.014940	0.032794	0.024425	0.260143
2.8	0.031094	0.050015	0.019626	0.143100	0.012169	0.023709	0.016876	0.169141
3.0	0.029016	0.041910	0.015464	0.105559	0.010109	0.017401	0.011799	0.111060
3.5	0.024796	0.027257	0.008592	0.049672	0.006833	0.008502	0.005038	0.040237
4.0	0.021602	0.017988	0.004821	0.023564	0.005009	0.004446	0.002262	0.015197
4.5	0.019124	0.012018	0.002727	0.011252	0.003899	0.002456	0.001056	0.005925
5.0	0.017157	0.008114	0.001553	0.005402	0.003175	0.001420	0.000509	0.002367
6.0	0.014257	0.003796	0.000513	0.001262	0.002312	0.000527	0.000127	0.000400
7.0	0.012237	0.001826	0.000173	0.000299	0.001830	0.000217	0.000035	0.000071
8.0	0.010757	0.000898	0.000059	0.000072	0.001529	0.000096	0.000010	0.000013
9.0	0.009630	0.000449	0.000020	0.000017	0.001325	0.000045	0.000003	0.000003
10.0	0.008743	0.000228	0.000007	0.000004	0.001180	0.000021	0.000001	0.000001

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.462657	2.366971	3.565388	4.330968	1.075218	5.786731	5.763939	50.547993
0.2	1.384498	2.112718	3.107214	3.604954	0.830652	4.402088	4.375520	37.909531
0.3	1.313109	1.890984	2.713331	3.010990	0.646405	3.368235	3.339279	28.557137
0.4	1.247767	1.696889	2.373797	2.522806	0.506794	2.592456	2.562227	21.608360
0.5	1.187837	1.526366	2.080365	2.119824	0.400365	2.007332	1.976686	16.424067
0.6	1.132752	1.376039	1.826154	1.785848	0.318727	1.563656	1.533260	12.539839
0.7	1.082026	1.243089	1.605426	1.508050	0.255703	1.225409	1.195739	9.617121
0.8	1.035217	1.125151	1.413362	1.276196	0.206730	0.966102	0.937505	7.408334
0.9	0.991938	1.020230	1.245900	1.082100	0.168422	0.766194	0.738904	5.731783
1.0	0.951849	0.926638	1.099625	0.919148	0.138257	0.611202	0.585364	4.453620
1.1	0.914643	0.842941	0.971626	0.781995	0.114343	0.490350	0.466048	3.474928
1.2	0.880052	0.767916	0.859436	0.666285	0.095257	0.395582	0.372846	2.722298
1.3	0.847834	0.700515	0.760959	0.568456	0.079923	0.320851	0.299673	2.141035
1.4	0.817775	0.639840	0.674390	0.485585	0.067522	0.261592	0.241936	1.690241
1.5	0.789682	0.585111	0.598188	0.415260	0.057428	0.214346	0.196158	1.339191
1.6	0.763383	0.535657	0.531029	0.355484	0.049161	0.176477	0.159690	1.064725
1.7	0.738725	0.490893	0.471769	0.304601	0.042347	0.145966	0.130505	0.849305
1.8	0.715568	0.450309	0.419424	0.261227	0.036698	0.121260	0.107045	0.679599
1.9	0.693789	0.413461	0.373139	0.224209	0.031987	0.101158	0.088107	0.545423
2.0	0.673275	0.379956	0.332171	0.192579	0.028036	0.084725	0.072757	0.438973
2.2	0.635649	0.321644	0.263702	0.142363	0.021884	0.060104	0.050068	0.286586
2.4	0.601994	0.273079	0.209795	0.105490	0.017423	0.043230	0.034836	0.188885
2.6	0.571733	0.232454	0.167229	0.078330	0.014128	0.031486	0.024476	0.125547
2.8	0.544395	0.198344	0.133531	0.058269	0.011651	0.023198	0.017349	0.084075
3.0	0.519585	0.169602	0.106791	0.043415	0.009759	0.017273	0.012393	0.056678
3.5	0.466592	0.115618	0.061449	0.020928	0.006656	0.008613	0.005504	0.021673
4.0	0.423601	0.079601	0.035615	0.010159	0.004880	0.004524	0.002531	0.008525
4.5	0.388020	0.055252	0.020766	0.004958	0.003789	0.002486	0.001197	0.003427
5.0	0.358063	0.038612	0.012168	0.002431	0.003077	0.001422	0.000580	0.001402
6.0	0.310344	0.019170	0.004230	0.000591	0.002236	0.000515	0.000145	0.000245
7.0	0.273926	0.009682	0.001489	0.000145	0.001771	0.000207	0.000039	0.000044
8.0	0.245138	0.004954	0.000530	0.000036	0.001484	0.000090	0.000011	0.000008
9.0	0.221758	0.002561	0.000190	0.000009	0.001291	0.000042	0.000003	0.000002
10.0	0.202366	0.001335	0.000069	0.000002	0.001154	0.000020	0.000001	0.000000

TABLE 16 A. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 0$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.153695	1.135072	0.954253	18.669094	1.844768	7.009621	6.691190	85.650818
0.2	0.139219	0.955732	0.793185	14.821268	1.365923	5.124379	4.885111	62.026619
0.3	0.126464	0.808096	0.661388	11.819557	1.016900	3.761513	3.579937	45.046989
0.4	0.115204	0.686076	0.553192	9.466496	0.761497	2.773156	2.633881	32.813004
0.5	0.105244	0.584829	0.464083	7.613188	0.573815	2.053971	1.945912	23.975626
0.6	0.096415	0.500485	0.390463	6.146772	0.435275	1.528774	1.443929	17.574623
0.7	0.088574	0.429944	0.329447	4.981300	0.332525	1.143776	1.076331	12.925279
0.8	0.081594	0.370716	0.278722	4.051033	0.255932	0.860417	0.806131	9.538423
0.9	0.075369	0.320794	0.236426	3.305458	0.198533	0.650971	0.606736	7.063748
1.0	0.069804	0.278554	0.201055	2.705552	0.155274	0.495463	0.458982	5.249917
1.1	0.064819	0.242681	0.171389	2.221037	0.122481	0.379456	0.349024	3.916161
1.2	0.060345	0.212102	0.146440	1.828334	0.097467	0.292485	0.266826	2.932152
1.3	0.056319	0.185944	0.125401	1.508968	0.078263	0.226945	0.205095	2.203694
1.4	0.052689	0.163488	0.107613	1.248419	0.063423	0.177287	0.158512	1.662534
1.5	0.049410	0.144145	0.092535	1.035212	0.051875	0.139451	0.123189	1.259084
1.6	0.046440	0.127429	0.079724	0.860251	0.042825	0.110455	0.096268	0.957210
1.7	0.043746	0.112936	0.068814	0.716291	0.035682	0.088102	0.075646	0.730510
1.8	0.041295	0.100333	0.059501	0.597544	0.030003	0.070765	0.059767	0.559632
1.9	0.039062	0.089341	0.051534	0.499361	0.025454	0.057234	0.047477	0.430353
2.0	0.037023	0.079726	0.044706	0.418002	0.021783	0.046607	0.037914	0.332179
2.2	0.033446	0.063877	0.033795	0.294231	0.016355	0.031527	0.024554	0.200097
2.4	0.030427	0.051561	0.025688	0.208253	0.012664	0.021872	0.016215	0.122255
2.6	0.027859	0.041901	0.019624	0.148124	0.010082	0.015533	0.010904	0.075710
2.8	0.025657	0.034257	0.015059	0.105818	0.008226	0.011270	0.007455	0.047486
3.0	0.023756	0.028162	0.011605	0.075893	0.006857	0.008336	0.005175	0.030141
3.5	0.020003	0.017617	0.006145	0.033553	0.004698	0.004210	0.002200	0.010138
4.0	0.017256	0.011294	0.003316	0.015096	0.003495	0.002302	0.000999	0.003611
4.5	0.015177	0.007383	0.001817	0.006889	0.002755	0.001333	0.000477	0.001348
5.0	0.013558	0.004904	0.001008	0.003180	0.002266	0.000806	0.000237	0.000524
6.0	0.011213	0.002245	0.000320	0.000697	0.001671	0.000322	0.000063	0.000087
7.0	0.009605	0.001067	0.000105	0.000157	0.001332	0.000139	0.000018	0.000016
8.0	0.008438	0.000521	0.000035	0.000036	0.001117	0.000063	0.000006	0.000003
9.0	0.007554	0.000260	0.000012	0.000008	0.000972	0.000030	0.000002	0.000001
10.0	0.006861	0.000132	0.000004	0.000002	0.000869	0.000015	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.722522	3.203659	5.145704	7.019958	0.968384	4.436473	4.446001	30.849638
0.2	1.608096	2.782954	4.386067	5.668481	0.738698	3.298143	3.301420	22.655464
0.3	1.505167	2.426599	3.748755	4.597100	0.567066	2.463137	2.461857	16.691990
0.4	1.412364	2.123497	3.212398	3.743552	0.438178	1.848362	1.843820	12.339350
0.5	1.328498	1.864640	2.759609	3.060295	0.340892	1.393974	1.387168	9.152880
0.6	1.252530	1.642690	2.376235	2.510842	0.267066	1.056763	1.048451	6.812932
0.7	1.183559	1.451649	2.050714	2.067063	0.210734	0.805445	0.796202	5.089138
0.8	1.120794	1.286597	1.773551	1.707139	0.167508	0.617314	0.607566	3.815122
0.9	1.063547	1.143478	1.536940	1.414075	0.134144	0.475834	0.465898	2.870382
1.0	1.011215	1.018947	1.334432	1.174561	0.108241	0.368928	0.359039	2.167443
1.1	0.963268	0.910223	1.160702	0.978132	0.088008	0.287750	0.278071	1.642612
1.2	0.919242	0.814996	1.011307	0.816505	0.072107	0.225794	0.216441	1.249397
1.3	0.878727	0.731333	0.882562	0.683105	0.059534	0.178263	0.169312	0.953751
1.4	0.841362	0.657614	0.771379	0.572684	0.049529	0.141604	0.133104	0.730681
1.5	0.806834	0.592476	0.675171	0.481037	0.041520	0.113177	0.105153	0.561772
1.6	0.774857	0.534764	0.591764	0.404782	0.035067	0.091012	0.083474	0.433422
1.7	0.745184	0.483505	0.519325	0.341184	0.029836	0.073634	0.066580	0.335547
1.8	0.717595	0.437867	0.456306	0.288026	0.025569	0.059932	0.053352	0.260650
1.9	0.691895	0.397141	0.401393	0.243503	0.022068	0.049068	0.042946	0.203139
2.0	0.667907	0.360719	0.353469	0.206141	0.019177	0.040406	0.034723	0.158827
2.2	0.624472	0.298777	0.274932	0.148286	0.014770	0.027863	0.022988	0.097997
2.4	0.586238	0.248666	0.214631	0.107144	0.011660	0.019626	0.015464	0.061181
2.6	0.552359	0.207851	0.168110	0.077720	0.009416	0.014100	0.010557	0.038619
2.8	0.522155	0.174407	0.132064	0.056573	0.007762	0.010316	0.007306	0.024629
3.0	0.495074	0.146851	0.104026	0.041307	0.006518	0.007674	0.005119	0.015857
3.5	0.438257	0.096789	0.057871	0.019035	0.004509	0.003901	0.002207	0.005475
4.0	0.393163	0.064786	0.032588	0.008890	0.003368	0.002133	0.001007	0.001979
4.5	0.356491	0.043905	0.018532	0.004197	0.002661	0.001233	0.000481	0.000743
5.0	0.326062	0.030058	0.010625	0.001998	0.002191	0.000744	0.000238	0.000289
6.0	0.278415	0.014430	0.003561	0.000462	0.001621	0.000296	0.000063	0.000047
7.0	0.242743	0.007100	0.001217	0.000109	0.001297	0.000128	0.000018	0.000008
8.0	0.214989	0.003558	0.000423	0.000026	0.001092	0.000058	0.000006	0.000002
9.0	0.192758	0.001809	0.000149	0.000006	0.000954	0.000028	0.000002	0.000000
10.0	0.174544	0.000930	0.000053	0.000002	0.000855	0.000013	0.000001	0.000000

TABLE 16 B. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 15$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.143052	1.015046	0.844?57	17.370594	1.867506	7.431866	7.111800	95.218460
0.2	0.130071	0.862413	0.707490	13.883474	1.385020	5.445665	5.203378	69.071121
0.3	0.118597	0.735601	0.594543	11.144354	1.033005	4.007290	3.821956	50.253624
0.4	0.108434	0.629838	0.501042	8.982483	0.775136	2.962193	2.818823	36.676346
0.5	0.099414	0.541288	0.423403	7.268303	0.585410	2.200166	2.087946	26.853689
0.6	0.091392	0.466868	0.358740	5.903016	0.445177	1.642464	1.553554	19.727474
0.7	0.084244	0.404085	0.304727	4.810926	0.341015	1.232687	1.161367	14.542344
0.8	0.077860	0.350924	0.259479	3.933776	0.263242	0.930330	0.872417	10.758159
0.9	0.072147	0.305746	0.221468	3.226503	0.204853	0.706254	0.658660	7.987658
1.0	0.067024	0.267214	0.189451	2.654059	0.160761	0.539417	0.499852	5.952702
1.1	0.062420	0.234235	0.162411	2.189106	0.127264	0.414591	0.381344	4.452987
1.2	0.058274	0.205914	0.139517	1.810205	0.101652	0.320722	0.292503	3.343915
1.3	0.054533	0.181512	0.120086	1.500448	0.081941	0.249757	0.225586	2.520830
1.4	0.051149	0.160419	0.103555	1.246470	0.066666	0.195811	0.174936	1.907774
1.5	0.048082	0.142130	0.089459	1.037638	0.054746	0.154569	0.136408	1.449476
1.6	0.045297	0.126225	0.077413	0.865480	0.045377	0.122855	0.106951	1.105590
1.7	0.042762	0.112352	0.067098	0.723203	0.037958	0.098320	0.084313	0.846579
1.8	0.040451	0.100219	0.058248	0.605351	0.032040	0.079224	0.066825	0.650755
1.9	0.038339	0.089579	0.050640	0.507517	0.027284	0.064268	0.053246	0.502138
2.0	0.036405	0.080224	0.044087	0.426135	0.023432	0.052482	0.042645	0.388919
2.2	0.033000	0.064694	0.033547	0.301679	0.017709	0.035678	0.027768	0.235884
2.4	0.030111	0.052520	0.025652	0.214644	0.013789	0.024851	0.018424	0.145092
2.6	0.027643	0.042896	0.019701	0.153402	0.011029	0.017703	0.012440	0.090438
2.8	0.025518	0.035227	0.015192	0.110071	0.009032	0.012872	0.008534	0.057076
3.0	0.023676	0.029073	0.011758	0.079263	0.007551	0.009534	0.005940	0.036439
3.5	0.020018	0.018333	0.006284	0.035353	0.005195	0.004819	0.002536	0.012411
4.0	0.017322	0.011824	0.003416	0.016023	0.003871	0.002631	0.001153	0.004463
4.5	0.015270	0.007765	0.001883	0.007357	0.003052	0.001521	0.000550	0.001678
5.0	0.013664	0.005176	0.001050	0.003414	0.002508	0.000917	0.000273	0.000654
6.0	0.011327	0.002382	0.000336	0.000754	0.001845	0.000365	0.000073	0.000108
7.0	0.009716	0.001135	0.000110	0.000171	0.001466	0.000157	0.000021	0.000020
8.0	0.008543	0.000555	0.000037	0.000040	0.001226	0.000071	0.000006	0.000004
9.0	0.007652	0.000277	0.000013	0.000009	0.001063	0.000034	0.000002	0.000001
10.0	0.006953	0.000140	0.000004	0.000002	0.000946	0.000016	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.591916	2.830712	4.494294	6.363087	0.945752	4.448484	4.459715	32.822819
0.2	1.490041	2.475906	3.853517	5.171873	0.723598	3.324029	3.327710	24.179913
0.3	1.398161	2.173077	3.312280	4.220805	0.557302	2.495808	2.494055	17.873974
0.4	1.315113	1.913586	2.853764	3.457835	0.432174	1.883370	1.877791	13.258980
0.5	1.239870	1.690368	2.464219	2.842950	0.337519	1.428630	1.420431	9.870809
0.6	1.171546	1.497630	2.132368	2.345250	0.265516	1.089524	1.079615	7.375231
0.7	1.109365	1.330609	1.848915	1.940732	0.210432	0.835514	0.824573	5.530942
0.8	1.052645	1.185364	1.606192	1.610668	0.168040	0.644364	0.632890	4.163311
0.9	1.000790	1.058627	1.397848	1.340359	0.135220	0.499827	0.488185	3.145600
1.0	0.953281	0.947680	1.218596	1.118218	0.109653	0.389993	0.378447	2.385597
1.1	0.909654	0.850258	1.064042	0.935075	0.089612	0.306107	0.294843	1.816003
1.2	0.869510	0.764453	0.930498	0.783623	0.073803	0.241705	0.230851	1.387565
1.3	0.832492	0.688669	0.814883	0.658023	0.061253	0.192001	0.181638	1.064127
1.4	0.798281	0.621552	0.714600	0.553588	0.051226	0.153432	0.143611	0.819062
1.5	0.766604	0.561960	0.627458	0.466537	0.043164	0.123342	0.114089	0.632701
1.6	0.737213	0.508921	0.551611	0.393811	0.036640	0.099739	0.091059	0.490467
1.7	0.709889	0.461603	0.485485	0.332921	0.031328	0.081121	0.073011	0.381521
1.8	0.684441	0.419297	0.427747	0.281841	0.026976	0.066356	0.058800	0.297774
1.9	0.660694	0.381393	0.377260	0.238909	0.023388	0.054581	0.047560	0.233172
2.0	0.638493	0.347366	0.333055	0.202764	0.020411	0.045141	0.038629	0.183166
2.2	0.598203	0.289190	0.260275	0.146542	0.015844	0.031364	0.025789	0.114063
2.4	0.562632	0.241812	0.204070	0.106335	0.012592	0.022228	0.017475	0.071851
2.6	0.531031	0.202989	0.160476	0.077433	0.010226	0.016046	0.012006	0.045746
2.8	0.502787	0.170997	0.126533	0.056564	0.008468	0.011782	0.008353	0.029413
3.0	0.477407	0.144505	0.100012	0.041435	0.007136	0.008786	0.005878	0.019084
3.5	0.423978	0.096006	0.056063	0.019230	0.004964	0.004476	0.002553	0.006703
4.0	0.381388	0.064694	0.031777	0.009035	0.003716	0.002445	0.001169	0.002457
4.5	0.346630	0.044095	0.018174	0.004286	0.002936	0.001410	0.000558	0.000933
5.0	0.317699	0.030336	0.010472	0.002050	0.002416	0.000848	0.000276	0.000365
6.0	0.272226	0.014680	0.003539	0.000478	0.001783	0.000335	0.000073	0.000060
7.0	0.238032	0.007266	0.001219	0.000113	0.001421	0.000144	0.000021	0.000011
8.0	0.211326	0.003658	0.000426	0.000027	0.001193	0.000066	0.000006	0.000002
9.0	0.189868	0.001866	0.000150	0.000007	0.001038	0.000031	0.000002	0.000000
10.0	0.172235	0.000962	0.000054	0.000002	0.000927	0.000015	0.000001	0.000000

TABLE 16 C. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 30$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.133951	0.961161	0.788171	16.082808	1.953946	8.428395	8.096959	118.889008
0.2	0.122470	0.823225	0.664829	12.971579	1.451753	6.190351	5.937238	86.486862
0.3	0.112269	0.707792	0.562398	10.506462	1.084964	4.566845	4.371400	63.117172
0.4	0.103188	0.610804	0.477061	8.543747	0.815951	3.385039	3.232358	46.215759
0.5	0.095087	0.528989	0.405743	6.973705	0.617763	2.521584	2.400865	33.957119
0.6	0.087846	0.459708	0.345960	5.712175	0.471056	1.888257	1.791639	25.039221
0.7	0.081360	0.400814	0.295699	4.694210	0.361903	1.421794	1.343520	18.531301
0.8	0.075539	0.350567	0.253322	3.869464	0.280256	1.076734	1.012561	13.766632
0.9	0.070304	0.307541	0.217495	3.198708	0.218833	0.820302	0.767087	10.266521
1.0	0.065586	0.270568	0.187124	2.651242	0.172349	0.628814	0.584208	7.686413
1.1	0.061327	0.238691	0.161315	2.202901	0.136948	0.485100	0.447334	5.777665
1.2	0.057472	0.211116	0.139327	1.834569	0.109811	0.376672	0.344405	4.360407
1.3	0.053977	0.187187	0.120552	1.531086	0.088868	0.294421	0.266623	3.304129
1.4	0.050802	0.166359	0.104484	1.280331	0.072590	0.231675	0.207549	2.513888
1.5	0.047912	0.148178	0.090704	1.072617	0.059848	0.183531	0.162454	1.920384
1.6	0.045275	0.132262	0.078861	0.900146	0.049799	0.146372	0.127852	1.472893
1.7	0.042866	0.118292	0.068664	0.756611	0.041816	0.117518	0.101163	1.134167
1.8	0.040659	0.105998	0.059868	0.636912	0.035425	0.094977	0.080468	0.876756
1.9	0.038635	0.095154	0.052267	0.536896	0.030270	0.077258	0.064338	0.680372
2.0	0.036775	0.085565	0.045687	0.453174	0.026082	0.063244	0.051699	0.529958
2.2	0.033481	0.069520	0.035030	0.324016	0.019824	0.043164	0.033866	0.325047
2.4	0.030667	0.056817	0.026973	0.232666	0.015509	0.030145	0.022588	0.202126
2.6	0.028247	0.046682	0.020850	0.167705	0.012450	0.021504	0.015316	0.127307
2.8	0.026152	0.038540	0.016173	0.121291	0.010224	0.015639	0.010543	0.081136
3.0	0.024327	0.031957	0.012585	0.087988	0.008565	0.011574	0.007356	0.052274
3.5	0.020671	0.020346	0.006805	0.039890	0.005906	0.005821	0.003147	0.018152
4.0	0.017951	0.013217	0.003735	0.018330	0.004401	0.003154	0.001429	0.006620
4.5	0.015865	0.008727	0.002075	0.008515	0.003468	0.001809	0.000679	0.002511
5.0	0.014223	0.005841	0.001164	0.003992	0.002846	0.001083	0.000334	0.000983
6.0	0.011819	0.002703	0.000376	0.000896	0.002088	0.000426	0.000088	0.000162
7.0	0.010153	0.001293	0.000124	0.000206	0.001655	0.000182	0.000025	0.000029
8.0	0.008934	0.000634	0.000042	0.000048	0.001380	0.000082	0.000008	0.000005
9.0	0.008006	0.000317	0.000014	0.000011	0.001193	0.000039	0.000002	0.000001
10.0	0.007277	0.000161	0.000005	0.000003	0.001059	0.000019	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.474397	2.648495	4.146721	5.778941	0.946274	4.727589	4.731819	37.691360
0.2	1.385295	2.329828	3.571820	4.728867	0.726808	3.552840	3.550097	27.929266
0.3	1.304615	2.056278	3.083898	3.884876	0.562133	2.683804	2.676149	20.773268
0.4	1.231398	1.820524	2.668583	3.203253	0.437901	2.038184	2.027164	15.509909
0.5	1.164804	1.616570	2.314075	2.650260	0.343651	1.556391	1.543179	11.625177
0.6	1.104104	1.439467	2.010667	2.199690	0.271728	1.195189	1.180663	8.747701
0.7	1.048650	1.285136	1.750322	1.831083	0.216514	0.923092	0.907901	6.608552
0.8	0.997884	1.150188	1.526390	1.528384	0.173864	0.717107	0.701723	5.012354
0.9	0.951305	1.031802	1.333329	1.278924	0.140711	0.560372	0.545138	3.816781
1.0	0.908479	0.927621	1.166516	1.072660	0.114774	0.440490	0.425649	2.917866
1.1	0.869025	0.835669	1.022085	0.901587	0.094352	0.348310	0.334025	2.239384
1.2	0.832596	0.754281	0.896783	0.759295	0.078166	0.277049	0.263426	1.725303
1.3	0.798898	0.682048	0.787875	0.640627	0.065253	0.221659	0.208762	1.334281
1.4	0.767662	0.617780	0.693049	0.541418	0.054883	0.178369	0.166230	1.035715
1.5	0.738652	0.560458	0.610344	0.458286	0.046503	0.144351	0.132978	0.806874
1.6	0.711660	0.509217	0.538099	0.388480	0.039685	0.117473	0.106857	0.630812
1.7	0.686497	0.463312	0.474896	0.329749	0.034104	0.096120	0.086241	0.494855
1.8	0.662999	0.422104	0.419526	0.280245	0.029507	0.079065	0.069895	0.389485
1.9	0.641017	0.385040	0.370953	0.238449	0.025696	0.065372	0.056877	0.307529
2.0	0.620417	0.351643	0.328290	0.203106	0.022519	0.054320	0.046463	0.243564
2.2	0.582901	0.294247	0.257744	0.147794	0.017607	0.038043	0.031348	0.154117
2.4	0.549639	0.247195	0.202957	0.107925	0.014076	0.027125	0.021440	0.098578
2.6	0.519971	0.208403	0.160242	0.079055	0.011483	0.019663	0.014846	0.063679
2.8	0.493364	0.176259	0.126822	0.058067	0.009542	0.014472	0.010396	0.041506
3.0	0.469374	0.149501	0.100590	0.042755	0.008061	0.010802	0.007355	0.027276
3.5	0.418624	0.100135	0.056828	0.020072	0.005623	0.005488	0.003220	0.009849
4.0	0.377924	0.067943	0.032426	0.009524	0.004209	0.002975	0.001478	0.003691
4.5	0.344541	0.046584	0.018654	0.004558	0.003323	0.001700	0.000704	0.001425
5.0	0.316638	0.032214	0.010803	0.002196	0.002730	0.001012	0.000347	0.000564
6.0	0.272557	0.015723	0.003683	0.000518	0.002008	0.000395	0.000090	0.000094
7.0	0.239215	0.007836	0.001277	0.000124	0.001595	0.000168	0.000026	0.000017
8.0	0.213049	0.003967	0.000449	0.000030	0.001335	0.000076	0.000008	0.000003
9.0	0.191934	0.002033	0.000159	0.000007	0.001158	0.000036	0.000002	0.000001
10.0	0.174519	0.001052	0.000057	0.000002	0.001032	0.000017	0.000001	0.000000

TABLE 16 D. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 45$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.130223	0.918332	0.742733	14.603916	2.069251	9.643903	9.340172	147.738739
0.2	0.119629	0.793723	0.631355	11.903152	1.538965	7.095577	6.860009	107.727066
0.3	0.110172	0.688506	0.538134	9.740588	1.151429	5.244641	5.059727	78.818306
0.4	0.101714	0.599306	0.459861	8.000520	0.867007	3.895399	3.748455	57.870823
0.5	0.094133	0.523386	0.393938	6.593966	0.657306	2.908104	2.789887	42.645817
0.6	0.087326	0.458521	0.338251	5.452049	0.501944	2.182733	2.086467	31.544907
0.7	0.081201	0.402896	0.291076	4.521209	0.386241	1.647515	1.568204	23.424179
0.8	0.075678	0.355023	0.251003	3.759519	0.299602	1.250817	1.184748	17.463150
0.9	0.070689	0.313680	0.216874	3.134017	0.234348	0.955397	0.899786	13.071834
1.0	0.066174	0.277857	0.187735	2.618647	0.184901	0.734303	0.687049	9.825084
1.1	0.062078	0.246718	0.162797	2.192708	0.147191	0.567979	0.527481	7.415466
1.2	0.058357	0.219568	0.141406	1.839676	0.118241	0.442184	0.407208	5.620245
1.3	0.054969	0.195828	0.123019	1.546295	0.095863	0.346514	0.316100	4.277508
1.4	0.051878	0.175010	0.107181	1.301890	0.078441	0.273338	0.246732	3.269178
1.5	0.049053	0.156707	0.093512	1.097821	0.064779	0.217040	0.193642	2.508915
1.6	0.046466	0.140575	0.081695	0.927074	0.053985	0.173470	0.152798	1.933359
1.7	0.044093	0.126321	0.071460	0.783928	0.045394	0.139546	0.121208	1.495854
1.8	0.041913	0.113698	0.062582	0.663709	0.038504	0.112972	0.096648	1.161932
1.9	0.039905	0.102496	0.054867	0.562575	0.032937	0.092030	0.077452	0.906038
2.0	0.038053	0.092533	0.048155	0.477363	0.028404	0.075424	0.062372	0.709155
2.2	0.034760	0.075729	0.037203	0.344720	0.021616	0.051551	0.041015	0.439147
2.4	0.031929	0.062291	0.028845	0.249813	0.016920	0.036010	0.027440	0.275645
2.6	0.029482	0.051472	0.022439	0.181598	0.013582	0.025664	0.018650	0.175185
2.8	0.027352	0.042710	0.017507	0.132375	0.011148	0.018626	0.012857	0.112611
3.0	0.025487	0.035574	0.013696	0.096733	0.009331	0.013744	0.008977	0.073138
3.5	0.021729	0.022855	0.007491	0.044567	0.006416	0.006840	0.003837	0.025848
4.0	0.018911	0.014946	0.004149	0.020760	0.004768	0.003660	0.001733	0.009558
4.5	0.016738	0.009918	0.002322	0.009757	0.003747	0.002072	0.000818	0.003662
5.0	0.015020	0.006663	0.001311	0.004620	0.003070	0.001226	0.000399	0.001443
6.0	0.012495	0.003098	0.000427	0.001054	0.002248	0.000474	0.000103	0.000239
7.0	0.010738	0.001485	0.000142	0.000245	0.001779	0.000201	0.000029	0.000042
8.0	0.009451	0.000729	0.000048	0.000058	0.001482	0.000090	0.000009	0.000008
9.0	0.008470	0.000365	0.000017	0.000014	0.001281	0.000042	0.000003	0.000002
10.0	0.007697	0.000185	0.000006	0.000003	0.001137	0.000020	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.418649	2.494186	3.852622	5.125625	0.970393	5.099757	5.113595	43.152348
0.2	1.337295	2.208542	3.336498	4.228225	0.747515	3.853184	3.856521	32.150486
0.3	1.263355	1.961591	2.895824	3.500860	0.579964	2.927190	2.923030	24.050480
0.4	1.196013	1.747254	2.518515	2.908533	0.453299	2.236176	2.226793	18.065134
0.5	1.134547	1.560538	2.194592	2.424038	0.356982	1.718060	1.705163	13.625697
0.6	1.078320	1.397301	1.915793	2.026096	0.283300	1.327667	1.312530	10.320169
0.7	1.026781	1.254109	1.675257	1.697981	0.226582	1.032015	1.015586	7.849264
0.8	0.979438	1.128092	1.467256	1.426473	0.182644	0.806946	0.789917	5.994868
0.9	0.935861	1.016850	1.287003	1.201058	0.148386	0.634698	0.617572	4.597538
1.0	0.895667	0.918365	1.130476	1.013339	0.121498	0.502160	0.485294	3.540340
1.1	0.858520	0.830929	0.994293	0.856566	0.100254	0.399619	0.383262	2.737211
1.2	0.824124	0.753105	0.875597	0.725302	0.083358	0.319849	0.304166	2.124616
1.3	0.792213	0.683661	0.771964	0.615126	0.069830	0.257450	0.242546	1.655468
1.4	0.762551	0.621554	0.681338	0.522449	0.058927	0.208370	0.194305	1.294735
1.5	0.734928	0.565885	0.601968	0.444331	0.050082	0.169556	0.156355	1.016276
1.6	0.709160	0.515882	0.532355	0.378365	0.042861	0.138694	0.126358	0.800490
1.7	0.685082	0.470883	0.471221	0.322561	0.036927	0.114024	0.102539	0.632643
1.8	0.662539	0.430311	0.417465	0.275280	0.032022	0.094202	0.083538	0.501605
1.9	0.641404	0.393667	0.370138	0.235161	0.027942	0.078193	0.068316	0.398936
2.0	0.621555	0.360518	0.328427	0.201073	0.024529	0.065199	0.056068	0.318219
2.2	0.585296	0.303230	0.259125	0.147372	0.019227	0.045920	0.038151	0.204162
2.4	0.553025	0.255940	0.204976	0.108334	0.015394	0.032866	0.026283	0.132327
2.6	0.524142	0.216703	0.162520	0.079845	0.012566	0.023873	0.018310	0.086559
2.8	0.498157	0.184000	0.129128	0.058984	0.010440	0.017580	0.012886	0.057090
3.0	0.474661	0.156632	0.102792	0.043662	0.008813	0.013109	0.009152	0.037935
3.5	0.424744	0.105741	0.058542	0.020742	0.006129	0.006611	0.004028	0.014039
4.0	0.384507	0.072219	0.033634	0.009942	0.004570	0.003541	0.001848	0.005368
4.5	0.351368	0.049791	0.019463	0.004799	0.003595	0.001994	0.000877	0.002107
5.0	0.323575	0.034597	0.011331	0.002330	0.002946	0.001171	0.000429	0.000844
6.0	0.279494	0.017017	0.003896	0.000557	0.002159	0.000446	0.000110	0.000143
7.0	0.246004	0.008533	0.001360	0.000135	0.001713	0.000187	0.000030	0.000025
8.0	0.219627	0.004341	0.000481	0.000033	0.001431	0.000083	0.000009	0.000005
9.0	0.198273	0.002233	0.000171	0.000008	0.001241	0.000039	0.000003	0.000001
10.0	0.180612	0.001159	0.000062	0.000002	0.001105	0.000019	0.000001	0.000000

TABLE 16 E. CRRES Omnidirectional Geometric Factors for Power Law Spectra Sin^6 α Pitch Angle Path Length Distribution Computation, λ = 60

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.129818	0.889776	0.707681	13.410593	2.186150	10.764181	10.473797	173.602844
0.2	0.119709	0.774610	0.605266	11.015709	1.626262	7.928463	7.700666	126.792564
0.3	0.110648	0.676662	0.519002	9.082786	1.217046	5.867246	5.686291	92.932007
0.4	0.102512	0.593018	0.446114	7.515243	0.916665	4.363448	4.217915	68.364723
0.5	0.095192	0.521312	0.384341	6.238239	0.695158	3.262041	3.143541	50.483662
0.6	0.088592	0.459606	0.331836	5.193528	0.531009	2.451992	2.354372	37.426006
0.7	0.082630	0.406314	0.287085	4.335485	0.408730	1.853619	1.772306	27.857796
0.8	0.077234	0.360129	0.248843	3.628190	0.317136	1.409567	1.341137	20.821415
0.9	0.072341	0.319970	0.216083	3.043184	0.248125	1.078439	1.020310	15.627750
1.0	0.067896	0.284940	0.187951	2.557815	0.195810	0.830267	0.780470	11.779626
1.1	0.063850	0.254292	0.163741	2.153967	0.155896	0.643289	0.600307	8.917233
1.2	0.060160	0.227401	0.142861	1.817051	0.125238	0.501646	0.464300	6.779535
1.3	0.056788	0.203744	0.124818	1.535295	0.101528	0.393743	0.361104	5.176538
1.4	0.053703	0.182877	0.109197	1.299141	0.083060	0.311067	0.282396	3.969521
1.5	0.050873	0.164426	0.095650	1.100801	0.068570	0.247348	0.222051	3.056865
1.6	0.048274	0.148074	0.083880	0.933914	0.057116	0.197946	0.175539	2.363887
1.7	0.045882	0.133551	0.073639	0.793241	0.047995	0.159413	0.139499	1.835497
1.8	0.043678	0.120624	0.064715	0.674477	0.040677	0.129175	0.111425	1.430924
1.9	0.041643	0.109097	0.056928	0.574063	0.034761	0.105304	0.089442	1.119868
2.0	0.039761	0.098799	0.050125	0.489047	0.029944	0.086347	0.072139	0.879734
2.2	0.036399	0.081319	0.038959	0.355815	0.022727	0.059033	0.047567	0.548777
2.4	0.033498	0.067228	0.030376	0.259654	0.017734	0.041208	0.031894	0.346950
2.6	0.030977	0.055802	0.023750	0.189980	0.014187	0.029318	0.021712	0.222055
2.8	0.028775	0.046487	0.018617	0.139325	0.011603	0.021224	0.014984	0.143707
3.0	0.026841	0.038857	0.014628	0.102388	0.009677	0.015608	0.010467	0.093938
3.5	0.022923	0.025144	0.008076	0.047772	0.006599	0.007681	0.004467	0.033685
4.0	0.019968	0.016530	0.004508	0.022494	0.004871	0.004055	0.002009	0.012609
4.5	0.017680	0.011012	0.002539	0.010671	0.003810	0.002264	0.000942	0.004878
5.0	0.015867	0.007419	0.001441	0.005094	0.003111	0.001322	0.000456	0.001937
6.0	0.013195	0.003462	0.000473	0.001178	0.002271	0.000500	0.000116	0.000324
7.0	0.011334	0.001663	0.000159	0.000277	0.001797	0.000209	0.000032	0.000058
8.0	0.009971	0.000817	0.000054	0.000066	0.001498	0.000093	0.000009	0.000011
9.0	0.008931	0.000409	0.000019	0.000016	0.001296	0.000043	0.000003	0.000002
10.0	0.008112	0.000207	0.000007	0.000004	0.001152	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm² MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.402126	2.386375	3.626299	4.624235	1.004888	5.441343	5.445580	47.489666
0.2	1.325210	2.124020	3.153967	3.837259	0.775570	4.128124	4.123476	35.524059
0.3	1.255083	1.895895	2.748739	3.195414	0.602945	3.149558	3.138606	26.686951
0.4	1.191012	1.696779	2.400142	2.669479	0.472247	2.416861	2.401575	20.134951
0.5	1.132351	1.522352	2.099483	2.236674	0.372703	1.865510	1.847401	15.257811
0.6	1.078532	1.369027	1.839550	1.879073	0.296418	1.448489	1.428694	11.612545
0.7	1.029051	1.233820	1.614303	1.582518	0.237586	1.131398	1.110774	8.876703
0.8	0.983472	1.114215	1.418694	1.335739	0.191920	0.888989	0.868163	6.814780
0.9	0.941398	1.008102	1.248486	1.129744	0.156239	0.702654	0.682077	5.254162
1.0	0.902487	0.913705	1.100091	0.957292	0.128173	0.558624	0.538620	4.067962
1.1	0.866433	0.829511	0.970487	0.812540	0.105950	0.446672	0.427459	3.162499
1.2	0.832960	0.754236	0.857104	0.690747	0.088234	0.359167	0.340885	2.468434
1.3	0.801830	0.686778	0.757756	0.588043	0.074017	0.290387	0.273120	1.934177
1.4	0.772828	0.626196	0.670578	0.501261	0.062532	0.236029	0.219815	1.521245
1.5	0.745758	0.571680	0.593973	0.427796	0.053194	0.192834	0.177682	1.200798
1.6	0.720452	0.522529	0.526571	0.365499	0.045553	0.158324	0.144221	0.951142
1.7	0.696753	0.478135	0.467196	0.312589	0.039262	0.130612	0.117525	0.755895
1.8	0.674524	0.437970	0.414831	0.267589	0.034050	0.108243	0.096131	0.602634
1.9	0.653641	0.401575	0.368600	0.229265	0.029708	0.090099	0.078914	0.481896
2.0	0.633994	0.368546	0.327743	0.196586	0.026068	0.075312	0.065000	0.386454
2.2	0.598011	0.311217	0.259600	0.144854	0.020404	0.053248	0.044519	0.250534
2.4	0.565885	0.263631	0.206097	0.107011	0.016298	0.038204	0.030845	0.164011
2.6	0.537051	0.223950	0.163958	0.079233	0.013265	0.027782	0.021593	0.108309
2.8	0.511040	0.190727	0.130677	0.058783	0.010983	0.020454	0.015256	0.072083
3.0	0.487469	0.162807	0.104328	0.043688	0.009238	0.015232	0.010869	0.048308
3.5	0.437221	0.110569	0.059800	0.020940	0.006364	0.007622	0.004805	0.018225
4.0	0.396553	0.075889	0.034545	0.010114	0.004707	0.004032	0.002205	0.007084
4.5	0.362951	0.052538	0.020084	0.004915	0.003679	0.002237	0.001044	0.002819
5.0	0.334702	0.036634	0.011740	0.002401	0.003001	0.001294	0.000507	0.001143
6.0	0.289767	0.018123	0.004064	0.000580	0.002189	0.000479	0.000128	0.000197
7.0	0.255525	0.009127	0.001427	0.000142	0.001735	0.000196	0.000035	0.000035
8.0	0.228488	0.004660	0.000506	0.000035	0.001451	0.000087	0.000010	0.000007
9.0	0.206553	0.002405	0.000181	0.000009	0.001260	0.000040	0.000003	0.000001
10.0	0.188376	0.001251	0.000065	0.000002	0.001124	0.000019	0.000001	0.000000

TABLE 16 F. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 75$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.131740	0.875476	0.689157	12.686616	2.291844	11.555367	11.271485	190.534790
0.2	0.121765	0.765343	0.591432	10.463888	1.704782	8.516230	8.291541	139.282166
0.3	0.112802	0.671295	0.508839	8.662563	1.275728	6.306295	6.126221	102.185646
0.4	0.104732	0.590653	0.438814	7.195703	0.960796	4.693296	4.547204	75.251884
0.5	0.097453	0.521234	0.379265	5.995823	0.728562	3.511318	3.391392	55.633568
0.6	0.090874	0.461250	0.328478	5.010234	0.556467	2.641540	2.541990	41.295380
0.7	0.084916	0.409234	0.285046	4.197505	0.428269	1.998656	1.915155	30.779230
0.8	0.079511	0.363970	0.247808	3.524932	0.332239	1.521249	1.450545	23.038046
0.9	0.074598	0.324455	0.215802	2.966513	0.259884	1.164986	1.104604	17.317974
1.0	0.070123	0.289852	0.188230	2.501462	0.205030	0.897766	0.845802	13.074845
1.1	0.066041	0.259461	0.164425	2.113099	0.163178	0.696263	0.651242	9.914648
1.2	0.062309	0.232696	0.143832	1.787961	0.131030	0.543479	0.504241	7.551361
1.3	0.058892	0.209063	0.125983	1.515114	0.106166	0.426976	0.392602	5.776652
1.4	0.055758	0.188144	0.110484	1.285667	0.086798	0.337622	0.307374	4.438292
1.5	0.052879	0.169584	0.097003	1.092340	0.071601	0.268686	0.241963	3.424688
1.6	0.050228	0.153082	0.085259	0.929158	0.059589	0.215182	0.191494	2.653761
1.7	0.047784	0.138378	0.075013	0.791194	0.050023	0.173406	0.152345	2.064897
1.8	0.045528	0.125252	0.066061	0.674377	0.042349	0.140590	0.121816	1.613187
1.9	0.043440	0.113512	0.058230	0.575330	0.036146	0.114657	0.097883	1.265232
2.0	0.041507	0.102994	0.051371	0.491244	0.031096	0.094042	0.079024	0.996088
2.2	0.038045	0.085072	0.040075	0.358963	0.023533	0.064301	0.052199	0.624072
2.4	0.035048	0.070553	0.031352	0.263016	0.018306	0.044862	0.035052	0.396264
2.6	0.032437	0.058728	0.024591	0.193173	0.014596	0.031882	0.023890	0.254696
2.8	0.030151	0.049048	0.019333	0.142174	0.011898	0.023039	0.016500	0.165512
3.0	0.028138	0.041090	0.015232	0.104834	0.009891	0.016903	0.011532	0.108622
3.5	0.024049	0.026712	0.008460	0.049287	0.006697	0.008253	0.004920	0.039308
4.0	0.020954	0.017621	0.004745	0.023363	0.004915	0.004314	0.002208	0.014831
4.5	0.018552	0.011769	0.002684	0.011148	0.003830	0.002382	0.001030	0.005776
5.0	0.016646	0.007944	0.001528	0.005349	0.003121	0.001377	0.000496	0.002306
6.0	0.013834	0.003715	0.000504	0.001248	0.002275	0.000511	0.000124	0.000389
7.0	0.011875	0.001787	0.000170	0.000295	0.001802	0.000211	0.000034	0.000069
8.0	0.010440	0.000878	0.000058	0.000071	0.001505	0.000093	0.000010	0.000013
9.0	0.009347	0.000439	0.000020	0.000017	0.001305	0.000043	0.000003	0.000002
10.0	0.008486	0.000223	0.000007	0.000004	0.001162	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.414929	2.329264	3.505438	4.334063	1.042319	5.676846	5.671995	50.020561
0.2	1.339485	2.079216	3.055892	3.607288	0.805319	4.317562	4.305333	37.503685
0.3	1.270558	1.861105	2.669242	3.012681	0.626764	3.302778	3.285365	28.243124
0.4	1.207461	1.670135	2.335802	2.523970	0.491456	2.541418	2.520553	21.364159
0.5	1.149578	1.502332	2.047517	2.120563	0.388302	1.967260	1.944275	16.233192
0.6	1.096370	1.354381	1.797673	1.786249	0.309168	1.531986	1.507890	12.389874
0.7	1.047361	1.223517	1.580665	1.508190	0.248073	1.200203	1.175760	9.498751
0.8	1.002130	1.107421	1.391779	1.276139	0.200595	0.945911	0.921677	7.314475
0.9	0.960308	1.004127	1.227049	1.081892	0.163453	0.749917	0.726287	5.657033
1.0	0.921559	0.911983	1.083115	0.918836	0.134203	0.598000	0.575254	4.393852
1.1	0.885597	0.829580	0.957142	0.781611	0.111012	0.479578	0.457900	3.426950
1.2	0.852154	0.755713	0.846708	0.665856	0.092501	0.386745	0.366246	2.683642
1.3	0.821005	0.689352	0.749752	0.568004	0.077627	0.313562	0.294299	2.109789
1.4	0.791939	0.629613	0.664507	0.485125	0.065597	0.255550	0.237542	1.664898
1.5	0.764772	0.575731	0.589459	0.414803	0.055804	0.209313	0.192548	1.318579
1.6	0.739338	0.527043	0.523310	0.355039	0.047782	0.172266	0.156712	1.047916
1.7	0.715488	0.482973	0.464935	0.304174	0.041169	0.142429	0.128039	0.835563
1.8	0.693087	0.443021	0.413365	0.260822	0.035686	0.118277	0.104995	0.668336
1.9	0.672019	0.406746	0.367762	0.223829	0.031113	0.098633	0.086398	0.536173
2.0	0.652174	0.373766	0.327396	0.192225	0.027278	0.082580	0.071328	0.431360
2.2	0.615770	0.316371	0.259924	0.142060	0.021304	0.058542	0.049060	0.281401
2.4	0.583202	0.268575	0.206797	0.105238	0.016971	0.042079	0.034118	0.185332
2.6	0.553918	0.228599	0.164844	0.078123	0.013769	0.030630	0.023960	0.123099
2.8	0.527461	0.195035	0.131628	0.058100	0.011361	0.022555	0.016975	0.082380
3.0	0.503447	0.166759	0.105270	0.043279	0.009522	0.016786	0.012121	0.055500
3.5	0.452148	0.113657	0.060574	0.020851	0.006503	0.008362	0.005378	0.021192
4.0	0.410526	0.078238	0.035107	0.010116	0.004773	0.004389	0.002471	0.008324
4.5	0.376072	0.054297	0.020469	0.004936	0.003709	0.002411	0.001168	0.003343
5.0	0.347063	0.037940	0.011994	0.002419	0.003014	0.001379	0.000565	0.001366
6.0	0.300844	0.018831	0.004169	0.000587	0.002192	0.000499	0.000141	0.000238
7.0	0.265566	0.009509	0.001468	0.000144	0.001737	0.000201	0.000038	0.000043
8.0	0.237675	0.004865	0.000522	0.000036	0.001455	0.000088	0.000011	0.000008
9.0	0.215021	0.002515	0.000187	0.000009	0.001266	0.000040	0.000003	0.000002
10.0	0.196228	0.001311	0.000068	0.000002	0.001131	0.000019	0.000001	0.000000

TABLE 16 G. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^6 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 90$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.135479	0.882815	0.692594	12.486215	2.382732	11.993447	11.678953	197.023712
0.2	0.125309	0.772624	0.594705	10.309940	1.772268	8.841374	8.593263	144.069855
0.3	0.116164	0.678436	0.511949	8.544492	1.326130	6.548941	6.350796	105.733604
0.4	0.107926	0.597593	0.441761	7.105353	0.998674	4.875436	4.715258	77.893105
0.5	0.100488	0.527931	0.382050	5.926934	0.757216	3.648861	3.517858	57.609356
0.6	0.093762	0.467675	0.331101	4.957910	0.578293	2.746056	2.637705	42.780506
0.7	0.087666	0.415366	0.287508	4.158002	0.445012	2.078583	1.988030	31.901070
0.8	0.082131	0.369799	0.250112	3.495313	0.345180	1.582777	1.506363	23.889723
0.9	0.077096	0.329977	0.217953	2.944520	0.269961	1.212666	1.147620	17.967804
1.0	0.072508	0.295066	0.190231	2.485339	0.212939	0.934963	0.879155	13.573191
1.1	0.068319	0.264373	0.166284	2.101478	0.169433	0.725477	0.677261	10.298731
1.2	0.064488	0.237313	0.145554	1.779774	0.136016	0.566575	0.524661	7.848837
1.3	0.060977	0.213395	0.127574	1.509536	0.110171	0.445355	0.408723	6.008169
1.4	0.057755	0.192201	0.111951	1.282059	0.090040	0.352340	0.320174	4.619327
1.5	0.054792	0.173379	0.098354	1.090205	0.074245	0.280545	0.252183	3.566903
1.6	0.052064	0.156626	0.086501	0.928111	0.061760	0.224795	0.199697	2.765970
1.7	0.049546	0.141685	0.076152	0.790940	0.051819	0.181243	0.158963	2.153805
1.8	0.047220	0.128334	0.067105	0.674689	0.043845	0.147013	0.127182	1.683921
1.9	0.045068	0.116383	0.059185	0.576035	0.037400	0.119948	0.102253	1.321723
2.0	0.043072	0.105666	0.052243	0.492209	0.032153	0.098422	0.082599	1.041368
2.2	0.039498	0.087383	0.040801	0.360179	0.024297	0.067342	0.054620	0.653458
2.4	0.036399	0.072548	0.031954	0.264262	0.018870	0.047009	0.036715	0.415569
2.6	0.033698	0.060447	0.025089	0.194335	0.015020	0.033418	0.025046	0.267514
2.8	0.031330	0.050529	0.019744	0.143201	0.012222	0.024152	0.017312	0.174103
3.0	0.029244	0.042365	0.015569	0.105712	0.010143	0.017719	0.012108	0.114425
3.5	0.025002	0.027586	0.008665	0.049829	0.006839	0.008643	0.005172	0.041548
4.0	0.021787	0.018222	0.004869	0.023674	0.005002	0.004510	0.002322	0.015723
4.5	0.019290	0.012182	0.002758	0.011319	0.003887	0.002485	0.001084	0.006140
5.0	0.017307	0.008229	0.001572	0.005441	0.003162	0.001432	0.000522	0.002457
6.0	0.014381	0.003852	0.000520	0.001273	0.002300	0.000529	0.000130	0.000416
7.0	0.012342	0.001854	0.000175	0.000302	0.001820	0.000217	0.000035	0.000074
8.0	0.010848	0.000911	0.000060	0.000072	0.001521	0.000096	0.000010	0.000014
9.0	0.009709	0.000456	0.000021	0.000018	0.001319	0.000045	0.000003	0.000003
10.0	0.008814	0.000231	0.000007	0.000004	0.001175	0.000021	0.000001	0.000001

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV) multiply by 10^{-3}

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.452430	2.343055	3.517477	4.256525	1.079433	5.830525	5.806658	50.977913
0.2	1.375635	2.093053	3.067244	3.545225	0.834283	4.438241	4.411016	38.251289
0.3	1.305445	1.874832	2.679961	2.962919	0.649537	3.398185	3.368849	28.830008
0.4	1.241153	1.683631	2.345906	2.483994	0.509500	2.617348	2.586900	21.827181
0.5	1.182143	1.515502	2.057035	2.088403	0.402706	2.028080	1.997320	16.600279
0.6	1.127869	1.367158	1.806622	1.760350	0.320754	1.581000	1.550542	12.682271
0.7	1.077852	1.235853	1.589068	1.487303	0.257460	1.239947	1.210241	9.732664
0.8	1.031667	1.119277	1.399652	1.259287	0.208256	0.978318	0.949696	7.502373
0.9	0.988940	1.015485	1.234410	1.068284	0.169748	0.776482	0.749168	5.808537
1.0	0.949337	0.922832	1.089986	0.907842	0.139409	0.619884	0.594021	4.516449
1.1	0.912559	0.839913	0.963543	0.772728	0.115345	0.497693	0.473359	3.526492
1.2	0.878346	0.765534	0.852661	0.658677	0.096129	0.401804	0.379028	2.764713
1.3	0.846463	0.698668	0.755274	0.562203	0.080682	0.326133	0.304907	2.175997
1.4	0.816699	0.638435	0.669622	0.480439	0.068184	0.266082	0.246374	1.719115
1.5	0.788866	0.584072	0.594193	0.411020	0.058005	0.218169	0.199924	1.363081
1.6	0.762799	0.534921	0.527682	0.351988	0.049663	0.179736	0.162890	1.084526
1.7	0.738345	0.490403	0.468969	0.301714	0.042784	0.148748	0.133226	0.865741
1.8	0.715370	0.450024	0.417081	0.258843	0.037078	0.123638	0.109361	0.693260
1.9	0.693751	0.413340	0.371181	0.222238	0.032318	0.103192	0.090080	0.556793
2.0	0.673380	0.379970	0.330538	0.190949	0.028325	0.086467	0.074440	0.448446
2.2	0.635995	0.321851	0.262571	0.141246	0.022102	0.061385	0.051294	0.293183
2.4	0.602528	0.273405	0.209018	0.104724	0.017587	0.044175	0.035732	0.193497
2.6	0.572418	0.232850	0.166701	0.077804	0.014250	0.032186	0.025133	0.128781
2.8	0.545199	0.198773	0.133178	0.057907	0.011742	0.023716	0.017831	0.086349
3.0	0.520483	0.170040	0.106560	0.043167	0.009826	0.017658	0.012748	0.058281
3.5	0.467649	0.116023	0.061382	0.020832	0.006683	0.008797	0.005670	0.022349
4.0	0.424745	0.079939	0.035609	0.010122	0.004888	0.004612	0.002609	0.008812
4.5	0.389208	0 055521	0.020779	0.004945	0.003787	0.002529	0.001234	0.003550
5.0	0.359273	0.038820	0.012184	0.002426	0.003070	0.001442	0.000598	0.001455
6.0	0.311556	0.019289	0.004240	0.000590	0.002227	0.000519	0.000149	0.000255
7.0	0.275115	0.009748	0.001495	0.000145	0.001763	0.000208	0.000040	0.000046
8.0	0.246293	0.004991	0.000532	0.000036	0.001477	0.000090	0.000011	0.000009
9.0	0.222875	0.002581	0.000191	0.000009	0.001285	0.000042	0.000003	0.000002
10.0	0.203443	0.001346	0.000069	0.000002	0.001149	0.000020	0.000001	0.000000

TABLE 17 A. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 0$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.154884	1.153808	0.981005	19.313311	1.793570	6.554131	6.272893	75.858093
0.2	0.140062	0.967862	0.812631	15.257346	1.327043	4.785473	4.574317	54.842010
0.3	0.127023	0.815299	0.675307	12.107800	0.987146	3.508088	3.347949	39.757195
0.4	0.115529	0.689638	0.562945	9.650440	0.738543	2.582664	2.459880	28.904118
0.5	0.105376	0.585730	0.470714	7.724108	0.555955	1.910010	1.814768	21.076336
0.6	0.096390	0.499469	0.394764	6.207109	0.421258	1.419375	1.344586	15.415940
0.7	0.088421	0.427578	0.332026	5.007152	0.321425	1.060171	1.000696	11.311812
0.8	0.081337	0.367428	0.280041	4.053866	0.247061	0.796152	0.748249	8.327706
0.9	0.075028	0.316906	0.236835	3.293390	0.191377	0.601283	0.562211	6.151661
1.0	0.069397	0.274307	0.200818	2.684304	0.149450	0.456818	0.424555	4.560064
1.1	0.064359	0.238252	0.170707	2.194604	0.117696	0.349218	0.322268	3.392323
1.2	0.059844	0.207623	0.145462	1.799450	0.093501	0.268687	0.245926	2.532803
1.3	0.055786	0.181508	0.124237	1.479482	0.074947	0.208102	0.188687	1.898058
1.4	0.052134	0.159162	0.106346	1.219538	0.060626	0.162280	0.145568	1.427720
1.5	0.048837	0.139974	0.091224	1.007695	0.049497	0.127430	0.112928	1.077994
1.6	0.045856	0.123443	0.078412	0.834544	0.040787	0.100772	0.088096	0.817034
1.7	0.043155	0.109153	0.067531	0.692624	0.033922	0.080258	0.069108	0.621612
1.8	0.040701	0.096762	0.058267	0.575990	0.028472	0.064376	0.054514	0.474737
1.9	0.038468	0.085984	0.050363	0.479903	0.024114	0.052002	0.043239	0.363942
2.0	0.036431	0.076582	0.043605	0.400555	0.020602	0.042301	0.034480	0.280057
2.2	0.032863	0.061140	0.032843	0.280423	0.015421	0.028567	0.022274	0.167690
2.4	0.029859	0.049197	0.024881	0.197491	0.011909	0.019798	0.014679	0.101870
2.6	0.027307	0.039868	0.018950	0.139823	0.009460	0.014055	0.009856	0.062749
2.8	0.025124	0.032514	0.014503	0.099464	0.007705	0.010200	0.006732	0.039165
3.0	0.023243	0.026671	0.011148	0.071057	0.006414	0.007549	0.004671	0.024751
3.5	0.019536	0.016610	0.005872	0.031147	0.004384	0.003823	0.001986	0.008256
4.0	0.016832	0.010612	0.003155	0.013915	0.003259	0.002097	0.000903	0.002927
4.5	0.014790	0.006920	0.001723	0.006312	0.002569	0.001219	0.000432	0.001092
5.0	0.013202	0.004587	0.000954	0.002900	0.002114	0.000739	0.000215	0.000425
6.0	0.010908	0.002094	0.000301	0.000630	0.001561	0.000296	0.000058	0.000071
7.0	0.009338	0.000993	0.000098	0.000141	0.001246	0.000128	0.000017	0.000013
8.0	0.008200	0.000485	0.000033	0.000032	0.001047	0.000059	0.000005	0.000003
9.0	0.007339	0.000241	0.000011	0.000008	0.000913	0.000028	0.000002	0.000001
10.0	0.006666	0.000122	0.000004	0.000002	0.000817	0.000013	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.740840	3.272689	5.318765	7.350232	0.956075	4.275214	4.301806	28.473330
0.2	1.623329	2.835148	4.522591	5.912613	0.728367	3.169605	3.185888	20.844091
0.3	1.517749	2.465522	3.856336	4.777167	0.558343	2.360331	2.369079	15.306189
0.4	1.422660	2.151970	3.297026	3.875937	0.430775	1.765861	1.769152	11.275282
0.5	1.336823	1.884902	2.826040	3.157181	0.334575	1.327551	1.326944	8.332971
0.6	1.259156	1.656513	2.428232	2.581316	0.261650	1.003110	0.999772	6.178957
0.7	1.188716	1.460443	2.091257	2.117904	0.206071	0.761972	0.756770	4.597284
0.8	1.124683	1.291477	1.805012	1.743402	0.163474	0.581979	0.575559	3.432277
0.9	1.066340	1.145333	1.561202	1.439550	0.130641	0.447025	0.439865	2.571440
1.0	1.013059	1.018481	1.352997	1.192081	0.105186	0.345368	0.337820	1.933298
1.1	0.964288	0.907997	1.174760	0.989809	0.085334	0.268425	0.260742	1.458677
1.2	0.919550	0.811453	1.021813	0.823919	0.069758	0.209897	0.202261	1.104492
1.3	0.878415	0.726824	0.890270	0.687437	0.057462	0.165147	0.157686	0.839286
1.4	0.840516	0.652418	0.776892	0.574813	0.047696	0.130751	0.123552	0.640021
1.5	0.805521	0.586810	0.678970	0.481617	0.039892	0.104171	0.097292	0.489788
1.6	0.773138	0.528803	0.594231	0.404294	0.033616	0.083518	0.076992	0.376128
1.7	0.743114	0.477381	0.520764	0.339987	0.028539	0.067380	0.061225	0.289842
1.8	0.715218	0.431686	0.456957	0.286379	0.024406	0.054698	0.048920	0.224110
1.9	0.689252	0.390984	0.401448	0.241594	0.021021	0.044677	0.039272	0.173865
2.0	0.665034	0.354648	0.353082	0.204107	0.018231	0.036711	0.031672	0.135327
2.2	0.621225	0.293003	0.273990	0.146257	0.013992	0.025225	0.020873	0.082769
2.4	0.582708	0.243290	0.213433	0.105300	0.011011	0.017723	0.013988	0.051244
2.6	0.548620	0.202917	0.166835	0.076130	0.008869	0.012712	0.009520	0.032094
2.8	0.518262	0.169924	0.130816	0.055245	0.007295	0.009294	0.006573	0.020319
3.0	0.491067	0.142808	0.102863	0.040222	0.006115	0.006914	0.004599	0.012996
3.5	0.434098	0.093732	0.056999	0.018417	0.004218	0.003522	0.001979	0.004426
4.0	0.388967	0.062516	0.031988	0.008555	0.003146	0.001933	0.000904	0.001585
4.5	0.352323	0.042235	0.018137	0.004019	0.002485	0.001122	0.000433	0.000592
5.0	0.321959	0.028836	0.010371	0.001906	0.002046	0.000679	0.000215	0.000229
6.0	0.274492	0.013781	0.003460	0.000438	0.001515	0.000272	0.000058	0.000038
7.0	0.239027	0.006757	0.001178	0.000103	0.001213	0.000118	0.000017	0.000007
8.0	0.211479	0.003377	0.000408	0.000025	0.001024	0.000054	0.000005	0.000001
9.0	0.189447	0.001713	0.000143	0.000006	0.000895	0.000025	0.000002	0.000000
10.0	0.171420	0.000879	0.000051	0.000001	0.000804	0.000012	0.000001	0.000000

TABLE 17 B. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 15$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.144196	1.029064	0.861189	17.827812	1.830133	7.068409	6.770433	87.577141
0.2	0.130928	0.871615	0.719660	14.199277	1.356638	5.175247	4.949886	63.457645
0.3	0.119214	0.741188	0.603177	11.358624	1.011285	3.805067	3.632817	46.114471
0.4	0.108853	0.632729	0.507009	9.124196	0.758377	2.810158	2.677015	33.612682
0.5	0.099668	0.542190	0.427367	7.358457	0.572372	2.085237	1.981092	24.577154
0.6	0.091511	0.466321	0.361211	5.956857	0.434944	1.555096	1.472621	18.029032
0.7	0.084250	0.402506	0.306095	4.839479	0.332912	1.165882	1.099746	13.270052
0.8	0.077774	0.348627	0.260042	3.944988	0.256768	0.878953	0.825254	9.801119
0.9	0.071987	0.302970	0.221453	3.226076	0.199632	0.666505	0.622370	7.264785
1.0	0.066803	0.264140	0.189029	2.646081	0.156513	0.508479	0.471781	5.404411
1.1	0.062150	0.230998	0.161712	2.176474	0.123776	0.390367	0.359516	4.035389
1.2	0.057965	0.202615	0.138639	1.794945	0.098764	0.301642	0.275440	3.024542
1.3	0.054193	0.178223	0.119100	1.483967	0.079527	0.234640	0.212180	2.275574
1.4	0.050785	0.157193	0.102514	1.229720	0.064633	0.183764	0.164350	1.718683
1.5	0.047700	0.139004	0.088403	1.021256	0.053020	0.144914	0.128008	1.303111
1.6	0.044901	0.123223	0.076370	0.849866	0.043899	0.115073	0.100254	0.991858
1.7	0.042357	0.109492	0.066087	0.708594	0.036684	0.092014	0.078949	0.757876
1.8	0.040039	0.097508	0.057280	0.591868	0.030934	0.074087	0.062511	0.581322
1.9	0.037924	0.087022	0.049724	0.495205	0.026317	0.060063	0.049760	0.447599
2.0	0.035988	0.077821	0.043228	0.414986	0.022582	0.049022	0.039818	0.345935
2.2	0.032585	0.062590	0.032807	0.292709	0.017039	0.033302	0.025886	0.208928
2.4	0.029704	0.050692	0.025025	0.207557	0.013251	0.023191	0.017154	0.127987
2.6	0.027246	0.041317	0.019178	0.147872	0.010587	0.016524	0.011572	0.079467
2.8	0.025133	0.033868	0.014759	0.105796	0.008663	0.012022	0.007934	0.049971
3.0	0.023304	0.027906	0.011402	0.075980	0.007239	0.008912	0.005521	0.031798
3.5	0.019678	0.017539	0.006070	0.033688	0.004976	0.004519	0.002358	0.010758
4.0	0.017013	0.011284	0.003290	0.015193	0.003707	0.002476	0.001073	0.003852
4.5	0.014988	0.007398	0.001809	0.006946	0.002923	0.001436	0.000513	0.001445
5.0	0.013405	0.004924	0.001007	0.003212	0.002402	0.000868	0.000255	0.000563
6.0	0.011105	0.002261	0.000321	0.000706	0.001768	0.000347	0.000068	0.000094
7.0	0.009523	0.001077	0.000105	0.000159	0.001406	0.000150	0.000020	0.000017
8.0	0.008372	0.000526	0.000035	0.000037	0.001176	0.000068	0.000006	0.000003
9.0	0.007498	0.000263	0.000012	0.000009	0.001020	0.000032	0.000002	0.000001
10.0	0.006812	0.000133	0.000004	0.000002	0.000909	0.000016	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.608904	2.882166	4.604245	6.586687	0.937506	4.324576	4.343919	31.111769
0.2	1.504487	2.515196	3.940243	5.338889	0.716572	3.224952	3.235169	22.869581
0.3	1.410407	2.202723	3.380562	4.345407	0.551290	2.516301	2.419877	16.866589
0.4	1.325454	1.935591	2.907400	3.550624	0.427011	1.919339	1.818156	12.481544
0.5	1.248560	1.706331	2.506224	2.911860	0.333069	1.376885	1.372350	9.268590
0.6	1.178805	1.508823	2.165130	2.396220	0.261668	1.047568	1.040743	6.907042
0.7	1.115378	1.338049	1.874338	1.978232	0.207092	0.801386	0.793063	5.165675
0.8	1.057575	1.189858	1.625797	1.638061	0.165133	0.616514	0.607282	3.877357
0.9	1.004777	1.060824	1.412838	1.360176	0.132681	0.477029	0.467322	2.921004
1.0	0.956446	0.948097	1.229938	1.132375	0.107430	0.371276	0.361410	2.208634
1.1	0.912103	0.849306	1.072500	0.945007	0.087660	0.290696	0.280897	1.676143
1.2	0.871330	0.762463	0.936687	0.790419	0.072083	0.228980	0.219410	1.276710
1.3	0.833763	0.685903	0.819291	0.662501	0.059734	0.181464	0.172232	0.976017
1.4	0.799074	0.618221	0.717615	0.556368	0.049880	0.144684	0.135862	0.748843
1.5	0.766976	0.558230	0.629393	0.468084	0.041969	0.116060	0.107691	0.576599
1.6	0.737217	0.504920	0.552711	0.394473	0.035575	0.093661	0.085767	0.445536
1.7	0.709571	0.457438	0.485947	0.332961	0.030377	0.076036	0.068625	0.345454
1.8	0.683837	0.415049	0.427727	0.281452	0.026123	0.062090	0.055159	0.268760
1.9	0.659840	0.377126	0.376882	0.238237	0.022622	0.050995	0.044531	0.209783
2.0	0.637420	0.343129	0.332415	0.201915	0.019721	0.042118	0.036106	0.164275
2.2	0.596763	0.285117	0.259327	0.145550	0.015279	0.029201	0.024028	0.101672
2.4	0.560908	0.237989	0.203001	0.105362	0.012124	0.020667	0.016239	0.063668
2.6	0.529087	0.199457	0.159400	0.076554	0.009833	0.014908	0.011133	0.040309
2.8	0.500672	0.167773	0.125512	0.055806	0.008135	0.010945	0.007732	0.025781
3.0	0.475159	0.141584	0.099078	0.040801	0.006851	0.008166	0.005435	0.016646
3.5	0.421514	0.093780	0.055381	0.018854	0.004762	0.004172	0.002358	0.005785
4.0	0.378821	0.063032	0.031313	0.008826	0.003564	0.002288	0.001080	0.002103
4.5	0.344021	0.042866	0.017871	0.004174	0.002817	0.001325	0.000517	0.000794
5.0	0.315087	0.029435	0.010278	0.001990	0.002318	0.000800	0.000256	0.000310
6.0	0.269669	0.014198	0.003463	0.000462	0.001712	0.000318	0.000068	0.000051
7.0	0.235567	0.007010	0.001189	0.000109	0.001365	0.000137	0.000020	0.000009
8.0	0.208970	0.003523	0.000414	0.000026	0.001147	0.000063	0.000006	0.000002
9.0	0.187621	0.001794	0.000146	0.000006	0.000998	0.000030	0.000002	0.000000
10.0	0.170096	0.000924	0.000052	0.000002	0.000893	0.000014	0.000001	0.000000

TABLE 17 C. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 30$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

N	HILET CHANNEL 1	2	3	4	LOLET CHANNEL 1	2	3	4
0.1	0.134438	0.968534	0.794637	16.307964	1.936677	8.234947	7.923703	114.908493
0.2	0.122838	0.828498	0.669665	13.142445	1.438742	6.046164	5.808708	83.547615
0.3	0.112536	0.711433	0.565970	10.635989	1.075093	4.458786	4.275568	60.937576
0.4	0.103371	0.613183	0.479656	8.641797	0.808400	3.303600	3.160532	44.592190
0.5	0.095199	0.530396	0.407586	7.047741	0.611940	2.459851	2.346741	32.742222
0.6	0.087898	0.460373	0.347225	5.767885	0.466527	1.841176	1.750628	24.125837
0.7	0.081363	0.400919	0.296523	4.735911	0.358352	1.385676	1.312271	17.841347
0.8	0.075502	0.350252	0.253812	3.900487	0.277446	1.048850	0.988612	13.242986
0.9	0.070233	0.306918	0.217734	3.221604	0.216590	0.798645	0.748629	9.867194
1.0	0.065487	0.269725	0.187178	2.667949	0.170543	0.611888	0.569902	7.380426
1.1	0.061205	0.237694	0.161232	2.214911	0.135481	0.471791	0.436183	5.542105
1.2	0.057332	0.210019	0.139148	1.843033	0.108610	0.366146	0.335665	4.178214
1.3	0.053822	0.186031	0.120306	1.536876	0.087876	0.286046	0.259736	3.162584
1.4	0.050635	0.165175	0.104194	1.284128	0.071765	0.224974	0.202095	2.403426
1.5	0.047736	0.146989	0.090387	1.074936	0.059156	0.178140	0.158112	1.833813
1.6	0.045093	0.131087	0.078531	0.901375	0.049215	0.142012	0.124379	1.404766
1.7	0.042678	0.117143	0.068331	0.757056	0.041319	0.113974	0.098372	1.080343
1.8	0.040469	0.104886	0.059538	0.636799	0.035000	0.092082	0.078216	0.834072
1.9	0.038442	0.094084	0.051946	0.536397	0.029904	0.074883	0.062512	0.646400
2.0	0.036581	0.084541	0.045379	0.452418	0.025765	0.061287	0.050214	0.502828
2.2	0.033287	0.068597	0.034753	0.323012	0.019583	0.041819	0.032873	0.307581
2.4	0.030477	0.055995	0.026731	0.231624	0.015322	0.029208	0.021915	0.190752
2.6	0.028061	0.045957	0.020641	0.166733	0.012302	0.020843	0.014855	0.119827
2.8	0.025972	0.037904	0.015996	0.120435	0.010105	0.015167	0.010224	0.076173
3.0	0.024152	0.031403	0.012437	0.087261	0.008468	0.011234	0.007134	0.048955
3.5	0.020512	0.019958	0.006712	0.039448	0.005844	0.005664	0.003055	0.016904
4.0	0.017807	0.012947	0.003677	0.018081	0.004359	0.003079	0.001388	0.006137
4.5	0.015734	0.008541	0.002040	0.008381	0.003437	0.001771	0.000661	0.002319
5.0	0.014104	0.005712	0.001144	0.003921	0.002822	0.001063	0.000326	0.000906
6.0	0.011719	0.002640	0.000369	0.000877	0.002072	0.000420	0.000086	0.000149
7.0	0.010067	0.001262	0.000122	0.000201	0.001642	0.000180	0.000025	0.000027
8.0	0.008859	0.000618	0.000041	0.000047	0.001369	0.000082	0.000007	0.000005
9.0	0.007939	0.000309	0.000014	0.000011	0.001184	0.000038	0.000002	0.000001
10.0	0.007216	0.000157	0.000005	0.000003	0.001051	0.000019	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

multiply by 10^{-3}

N	HILET CHANNEL 1	2	3	4	LOLET CHANNEL 1	2	3	4
0.1	1.481957	2.674329	4.188049	5.871301	0.942558	4.672441	4.680588	37.067101
0.2	1.391821	2.350516	3.605158	4.801652	0.723646	3.507961	3.508814	27.439621
0.3	1.310239	2.072784	3.110785	3.942384	0.559431	2.647147	2.642749	20.387432
0.4	1.236231	1.833631	2.690254	3.348801	0.435582	2.008129	2.000043	15.204563
0.5	1.168946	1.626904	2.331521	2.886412	0.341654	1.531669	1.521083	11.382527
0.6	1.107639	1.447549	2.024693	2.528436	0.270003	1.174788	1.162600	8.554143
0.7	1.051654	1.291381	1.761577	1.853978	0.215019	0.906209	0.893090	6.453577
0.8	1.000420	1.154941	1.535398	1.546647	0.172565	0.703092	0.689544	4.887846
0.9	0.953431	1.035343	1.340514	1.293510	0.139579	0.548707	0.535096	3.716440
1.0	0.910246	0.930181	1.172226	1.084319	0.113786	0.430758	0.417349	2.836755
1.1	0.870473	0.837433	1.026599	0.910916	0.093487	0.340171	0.327147	2.173645
1.2	0.833766	0.755405	0.900330	0.766763	0.077407	0.270226	0.257715	1.671886
1.3	0.799820	0.682659	0.790640	0.646607	0.064587	0.215927	0.204010	1.290776
1.4	0.768366	0.617980	0.695181	0.546207	0.054297	0.173544	0.162269	1.000204
1.5	0.739165	0.560334	0.611969	0.462121	0.045985	0.140282	0.129670	0.777831
1.6	0.712003	0.508838	0.539314	0.391550	0.039228	0.114034	0.104089	0.607015
1.7	0.686690	0.462735	0.475784	0.332204	0.033699	0.093209	0.083922	0.475324
1.8	0.663059	0.421375	0.420154	0.282208	0.029147	0.076597	0.067950	0.373427
1.9	0.640959	0.384198	0.371374	0.240016	0.025377	0.063275	0.055242	0.294309
2.0	0.620253	0.350720	0.328548	0.204354	0.022235	0.052536	0.045087	0.232665
2.2	0.582562	0.293231	0.257776	0.148582	0.017381	0.036747	0.030371	0.146682
2.4	0.549162	0.246153	0.202856	0.108417	0.013894	0.026177	0.020742	0.093484
2.6	0.519386	0.207379	0.160069	0.079358	0.011336	0.018966	0.014346	0.060175
2.8	0.492691	0.175279	0.126616	0.058249	0.009421	0.013957	0.010037	0.039088
3.0	0.468632	0.148580	0.100375	0.042861	0.007962	0.010420	0.007097	0.025602
3.5	0.417765	0.099387	0.056642	0.020091	0.005560	0.005302	0.003105	0.009175
4.0	0.377001	0.067360	0.032288	0.009520	0.004167	0.002882	0.001425	0.003415
4.5	0.343584	0.046140	0.018558	0.004550	0.003292	0.001652	0.000680	0.001311
5.0	0.315665	0.031881	0.010740	0.002190	0.002707	0.000987	0.000335	0.000516
6.0	0.271582	0.015539	0.003657	0.000516	0.001992	0.000387	0.000088	0.000085
7.0	0.238257	0.007735	0.001267	0.000124	0.001584	0.000165	0.000025	0.000015
8.0	0.212118	0.003913	0.000445	0.000030	0.001325	0.000075	0.000008	0.000003
9.0	0.191032	0.002004	0.000158	0.000007	0.001150	0.000035	0.000002	0.000001
10.0	0.173648	0.001036	0.000056	0.000002	0.001025	0.000017	0.000001	0.000000

TABLE 17 D. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 45$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.130942	0.922111	0.745441	14.615715	2.072820	9.639226	9.313774	147.287750
0.2	0.120270	0.797122	0.633820	11.923046	1.541601	7.091609	6.840321	107.385750
0.3	0.110745	0.691546	0.540356	9.764544	1.153385	5.241262	5.044930	78.558273
0.4	0.102226	0.602008	0.461849	8.025949	0.868467	3.892504	3.737244	57.671173
0.5	0.094592	0.525778	0.395705	6.619233	0.658404	2.905620	2.781318	42.491531
0.6	0.087738	0.460630	0.339811	5.476152	0.502775	2.180597	2.079867	31.424850
0.7	0.081571	0.404750	0.292448	4.543572	0.386878	1.645675	1.563074	23.330109
0.8	0.076011	0.356649	0.252205	3.779877	0.300093	1.249232	1.180726	17.388912
0.9	0.070990	0.315102	0.217923	3.152296	0.234731	0.954029	0.896608	13.012953
1.0	0.066445	0.279098	0.188648	2.634874	0.185203	0.733124	0.684519	9.778043
1.1	0.062324	0.247799	0.163590	2.207000	0.147433	0.566962	0.525450	7.377687
1.2	0.058579	0.220508	0.142093	1.852175	0.118438	0.441308	0.405567	5.589766
1.3	0.055171	0.196643	0.123613	1.557172	0.096025	0.345760	0.314766	4.252783
1.4	0.052061	0.175718	0.107693	1.311311	0.078576	0.272689	0.245641	3.249040
1.5	0.049220	0.157320	0.093954	1.105953	0.064894	0.216483	0.192745	2.492449
1.6	0.046620	0.141105	0.082075	0.934072	0.054085	0.172991	0.152056	1.919845
1.7	0.044234	0.126779	0.071787	0.789937	0.045481	0.139135	0.120593	1.484726
1.8	0.042042	0.114094	0.062861	0.668857	0.038582	0.112620	0.096136	1.152744
1.9	0.040024	0.102837	0.055107	0.566976	0.033007	0.091729	0.077025	0.898433
2.0	0.038163	0.092827	0.048360	0.481122	0.028468	0.075167	0.062014	0.702844
2.2	0.034854	0.075947	0.037352	0.347450	0.021671	0.051364	0.040761	0.434777
2.4	0.032011	0.062451	0.028954	0.251787	0.016968	0.035876	0.027260	0.272599
2.6	0.029553	0.051590	0.022517	0.183022	0.013626	0.025567	0.018521	0.173052
2.8	0.027415	0.042796	0.017563	0.133399	0.011188	0.018558	0.012764	0.111110
3.0	0.025544	0.035636	0.013736	0.097468	0.009367	0.013696	0.008911	0.072079
3.5	0.021775	0.022882	0.007508	0.044886	0.006447	0.006822	0.003807	0.025400
4.0	0.018949	0.014957	0.004156	0.020898	0.004794	0.003655	0.001720	0.009367
4.5	0.016770	0.009922	0.002325	0.009816	0.003770	0.002072	0.000812	0.003580
5.0	0.015049	0.006664	0.001312	0.004645	0.003090	0.001228	0.000397	0.001408
6.0	0.012518	0.003097	0.000427	0.001059	0.002264	0.000475	0.000103	0.000233
7.0	0.010759	0.001485	0.000142	0.000246	0.001792	0.000201	0.000029	0.000041
8.0	0.009470	0.000729	0.000048	0.000058	0.001493	0.000091	0.000009	0.000008
9.0	0.008486	0.000364	0.000017	0.000014	0.001290	0.000042	0.000003	0.000002
10.0	0.007713	0.000185	0.000006	0.000003	0.001145	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.427241	2.504567	3.865755	5.116326	0.973649	5.112983	5.122698	43.293152
0.2	1.345276	2.218174	3.348688	4.224220	0.749920	3.862426	3.862599	32.249874
0.3	1.270789	1.970479	2.907045	3.500364	0.581747	2.933564	2.926960	24.120043
0.4	1.202950	1.755432	2.528773	2.910284	0.454623	2.240487	2.229214	18.113243
0.5	1.141029	1.568038	2.203919	2.427153	0.357967	1.720899	1.706530	13.658422
0.6	1.084394	1.404165	1.924243	2.029974	0.284035	1.329457	1.313169	10.341961
0.7	1.032480	1.260383	1.682878	1.702211	0.227132	1.033069	1.015736	7.863311
0.8	0.984799	1.133818	1.474109	1.430778	0.183057	0.807487	0.789744	6.003460
0.9	0.940912	1.022069	1.293149	1.205261	0.148696	0.634888	0.617193	4.602348
1.0	0.900436	0.923119	1.135981	1.017329	0.121732	0.502114	0.484796	3.542546
1.1	0.863030	0.835261	0.999215	0.860285	0.100432	0.399422	0.382700	2.737680
1.2	0.828397	0.757047	0.879989	0.728713	0.083493	0.319558	0.303583	2.123952
1.3	0.796268	0.687251	0.775879	0.618225	0.069934	0.257108	0.241967	1.654102
1.4	0.766405	0.624822	0.684826	0.525239	0.059008	0.208006	0.193747	1.292966
1.5	0.738601	0.568861	0.605073	0.446827	0.050146	0.169189	0.155829	1.014309
1.6	0.712663	0.518594	0.535118	0.380584	0.042912	0.138337	0.125870	0.798467
1.7	0.688427	0.473354	0.473677	0.324526	0.036969	0.113685	0.102091	0.630656
1.8	0.665740	0.432564	0.419646	0.277014	0.032057	0.093886	0.083131	0.499710
1.9	0.644470	0.395723	0.372077	0.236686	0.027972	0.077902	0.067948	0.397168
2.0	0.624497	0.362394	0.330149	0.202411	0.024556	0.064935	0.055739	0.316595
2.2	0.588015	0.304796	0.260484	0.148396	0.019250	0.045706	0.037890	0.202838
2.4	0.555550	0.257249	0.206048	0.109113	0.015415	0.032697	0.026079	0.131280
2.6	0.526498	0.217801	0.163365	0.080435	0.012586	0.023743	0.018153	0.085748
2.8	0.500362	0.184923	0.129795	0.059429	0.010459	0.017481	0.012765	0.056471
3.0	0.476734	0.157410	0.103320	0.043997	0.008832	0.013035	0.009059	0.037468
3.5	0.426544	0.106255	0.058836	0.020905	0.006147	0.006576	0.003981	0.013815
4.0	0.386095	0.072562	0.033799	0.010021	0.004588	0.003526	0.001825	0.005263
4.5	0.352785	0.050023	0.019556	0.004838	0.003612	0.001989	0.000866	0.002058
5.0	0.324854	0.034755	0.011383	0.002349	0.002962	0.001170	0.000423	0.000822
6.0	0.280556	0.017093	0.003914	0.000562	0.002172	0.000446	0.000109	0.000138
7.0	0.246907	0.008569	0.001366	0.000136	0.001724	0.000187	0.000030	0.000025
8.0	0.220405	0.004359	0.000483	0.000033	0.001441	0.000084	0.000009	0.000005
9.0	0.198952	0.002242	0.000172	0.000008	0.001250	0.000039	0.000003	0.000001
10.0	0.181210	0.001164	0.000062	0.000002	0.001113	0.000019	0.000001	0.000000

TABLE 17 E. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 60$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.130653	0.890070	0.706215	13.342063	2.200428	10.834165	10.504452	174.903809
0.2	0.120486	0.775250	0.604226	10.969614	1.636911	7.980569	7.723452	127.747192
0.3	0.111372	0.677540	0.518290	9.052798	1.225034	5.906218	5.703314	93.635124
0.4	0.103187	0.594049	0.445651	7.496681	0.922697	4.392752	4.230682	68.884308
0.5	0.095821	0.522434	0.384065	6.227721	0.699743	3.284191	3.153171	50.869061
0.6	0.089180	0.460773	0.331700	5.188591	0.534521	2.468827	2.361668	37.712814
0.7	0.083181	0.407492	0.287052	4.334353	0.411440	1.866486	1.777860	28.072062
0.8	0.077750	0.361292	0.248884	3.629578	0.319244	1.419456	1.345386	20.982073
0.9	0.072826	0.321101	0.216176	3.046181	0.249780	1.086083	1.023576	15.748647
1.0	0.068351	0.286027	0.188079	2.561774	0.197120	0.836211	0.782993	11.870902
1.1	0.064278	0.255328	0.163891	2.158423	0.156942	0.647939	0.602265	8.986408
1.2	0.060564	0.228382	0.143024	1.821693	0.126082	0.505306	0.465826	6.832146
1.3	0.057170	0.204666	0.124987	1.539914	0.102215	0.396640	0.362298	5.216681
1.4	0.054063	0.183739	0.109366	1.303600	0.083624	0.313374	0.283336	4.000247
1.5	0.051215	0.165230	0.095814	1.105013	0.069037	0.249197	0.222792	3.080461
1.6	0.048598	0.148822	0.084039	0.937826	0.057508	0.199435	0.176127	2.382064
1.7	0.046190	0.134244	0.073790	0.796834	0.048326	0.160620	0.139967	1.849539
1.8	0.043971	0.121267	0.064858	0.677746	0.040959	0.130159	0.111799	1.441802
1.9	0.041921	0.109691	0.057061	0.577014	0.035005	0.106111	0.089741	1.128316
2.0	0.040026	0.099347	0.050248	0.491697	0.030155	0.087012	0.072379	0.886313
2.2	0.036642	0.081784	0.039064	0.357919	0.022890	0.059492	0.047724	0.552793
2.4	0.033720	0.067622	0.030463	0.261301	0.017864	0.041532	0.031998	0.349420
2.6	0.031182	0.056135	0.023822	0.191256	0.014293	0.029552	0.021781	0.223585
2.8	0.028965	0.046769	0.018676	0.140306	0.011691	0.021395	0.015030	0.144659
3.0	0.027018	0.039095	0.014676	0.103138	0.009752	0.015736	0.010499	0.094533
3.5	0.023074	0.025301	0.008104	0.048149	0.006653	0.007747	0.004480	0.033871
4.0	0.020099	0.016634	0.004524	0.022681	0.004912	0.004092	0.002015	0.012667
4.5	0.017796	0.011082	0.002548	0.010763	0.003843	0.002286	0.000944	0.004896
5.0	0.015971	0.007466	0.001446	0.005138	0.003139	0.001336	0.000457	0.001942
6.0	0.013282	0.003484	0.000475	0.001189	0.002292	0.000506	0.000116	0.000324
7.0	0.011410	0.001674	0.000159	0.000279	0.001814	0.000211	0.000032	0.000058
8.0	0.010037	0.000822	0.000054	0.000067	0.001512	0.000094	0.000009	0.000011
9.0	0.008990	0.000411	0.000019	0.000016	0.001308	0.000044	0.000003	0.000002
10.0	0.008167	0.000209	0.000007	0.000004	0.001163	0.000021	0.000001	0.000000

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.411100	2.385482	3.616525	4.590785	1.011627	5.469662	5.458701	47.826527
0.2	1.333759	2.124047	3.146263	3.812485	0.780770	4.150259	4.133878	35.781387
0.3	1.263236	1.896607	2.742698	3.177124	0.606984	3.166943	3.146870	26.884296
0.4	1.198798	1.697996	2.395433	2.656062	0.475408	2.430574	2.408159	20.286827
0.5	1.139795	1.523935	2.095843	2.226899	0.375195	1.876380	1.852663	15.375125
0.6	1.085656	1.370867	1.836758	1.872023	0.298398	1.457141	1.432913	11.703461
0.7	1.035879	1.235826	1.612186	1.577496	0.239171	1.138319	1.114159	8.947392
0.8	0.990021	1.116319	1.417118	1.332231	0.193198	0.894547	0.870884	6.869905
0.9	0.947690	1.010257	1.247333	1.127355	0.157278	0.707134	0.684271	5.297274
1.0	0.908536	0.915868	1.099273	0.955727	0.129024	0.562249	0.540391	4.101771
1.1	0.872256	0.831654	0.969931	0.811580	0.106652	0.449618	0.428888	3.189093
1.2	0.838573	0.756334	0.856751	0.690221	0.088818	0.361569	0.342041	2.489388
1.3	0.807244	0.688817	0.757561	0.587828	0.074506	0.292354	0.274057	1.950730
1.4	0.778056	0.628164	0.670502	0.501265	0.062945	0.237645	0.220574	1.534350
1.5	0.750810	0.573569	0.593988	0.427950	0.053546	0.194165	0.178298	1.211191
1.6	0.725339	0.524335	0.526653	0.365750	0.045855	0.159427	0.144720	0.959402
1.7	0.701484	0.479855	0.467328	0.312901	0.039522	0.131527	0.117930	0.762469
1.8	0.679108	0.439605	0.414996	0.267934	0.034276	0.109006	0.096461	0.607873
1.9	0.658088	0.403123	0.368788	0.229623	0.029905	0.090738	0.079182	0.486079
2.0	0.638311	0.370010	0.327944	0.196945	0.026242	0.075848	0.065218	0.389798
2.2	0.602090	0.312519	0.259810	0.145187	0.020541	0.053629	0.044663	0.252678
2.4	0.569750	0.264783	0.206299	0.107303	0.016410	0.038480	0.030940	0.165390
2.6	0.540723	0.224967	0.164144	0.079480	0.013357	0.027985	0.021655	0.109199
2.8	0.514538	0.191622	0.130844	0.058986	0.011061	0.020605	0.015297	0.072659
3.0	0.490808	0.163593	0.104475	0.043852	0.009304	0.015346	0.010896	0.048681
3.5	0.440220	0.111134	0.059900	0.021033	0.006412	0.007682	0.004814	0.018351
4.0	0.399276	0.076295	0.034610	0.010164	0.004744	0.004067	0.002208	0.007127
4.5	0.365447	0.052830	0.020125	0.004942	0.003709	0.002258	0.001045	0.002833
5.0	0.337006	0.036844	0.011765	0.002414	0.003026	0.001307	0.000507	0.001148
6.0	0.291764	0.018232	0.004074	0.000583	0.002209	0.000484	0.000128	0.000197
7.0	0.257286	0.009184	0.001430	0.000143	0.001751	0.000199	0.000035	0.000035
8.0	0.230062	0.004690	0.000508	0.000035	0.001464	0.000088	0.000010	0.000007
9.0	0.207975	0.002420	0.000182	0.000009	0.001271	0.000041	0.000003	0.000001
10.0	0.189671	0.001260	0.000066	0.000002	0.001133	0.000020	0.000001	0.000000

TABLE 17 F. CRRES Omnidirectional Geometric Factors for Power Law Spectra $Sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 75$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.131860	0.875035	0.686223	12.609447	2.305950	11.678792	11.362877	192.842331
0.2	0.121913	0.765226	0.589173	10.404710	1.715267	8.608040	8.359537	140.985260
0.3	0.112972	0.671439	0.507114	8.617283	1.283566	6.374973	6.177076	103.447639
0.4	0.104920	0.591001	0.437509	7.161193	0.966693	4.744986	4.585459	76.191544
0.5	0.097654	0.521740	0.378290	5.969647	0.733029	3.550462	3.420332	56.336521
0.6	0.091085	0.461875	0.327762	4.990479	0.559874	2.671375	2.564010	41.823772
0.7	0.085135	0.409945	0.284533	4.182703	0.430884	2.021544	1.932013	31.178331
0.8	0.079735	0.364742	0.247452	3.513952	0.334262	1.538927	1.463524	23.340979
0.9	0.074825	0.325265	0.215568	2.958465	0.261460	1.178732	1.114661	17.549078
1.0	0.070352	0.290683	0.188089	2.495665	0.206267	0.908524	0.853642	13.252012
1.1	0.066270	0.260300	0.164356	2.109016	0.164154	0.704740	0.657389	10.051126
1.2	0.062538	0.233531	0.143817	1.785174	0.131806	0.550201	0.509089	7.657009
1.3	0.059120	0.209884	0.126008	1.513309	0.106787	0.432342	0.396447	5.858813
1.4	0.055983	0.188946	0.110538	1.284592	0.087297	0.341931	0.310440	4.502484
1.5	0.053101	0.170362	0.097078	1.091803	0.072005	0.272166	0.244421	3.475070
1.6	0.050447	0.153831	0.085348	0.929014	0.059917	0.218010	0.193474	2.693470
1.7	0.047999	0.139096	0.075111	0.791328	0.050292	0.175715	0.153948	2.096321
1.8	0.045739	0.125938	0.066164	0.674706	0.042569	0.142485	0.123119	1.638156
1.9	0.043647	0.114165	0.058335	0.575787	0.036327	0.116220	0.098947	1.285145
2.0	0.041709	0.103613	0.051475	0.491779	0.031245	0.095336	0.079896	1.012025
2.2	0.038238	0.085625	0.040174	0.359559	0.023635	0.065199	0.052792	0.634379
2.4	0.035232	0.071043	0.031442	0.263593	0.018375	0.045495	0.035460	0.403010
2.6	0.032612	0.059159	0.024671	0.193694	0.014643	0.032333	0.024174	0.259158
2.8	0.030317	0.049427	0.019403	0.142625	0.011928	0.023364	0.016699	0.168489
3.0	0.028296	0.041421	0.015291	0.105214	0.009910	0.017139	0.011673	0.110624
3.5	0.024188	0.026945	0.008499	0.049515	0.006699	0.008363	0.004981	0.040072
4.0	0.021078	0.017784	0.004770	0.023491	0.004910	0.004367	0.002235	0.015131
4.5	0.018662	0.011882	0.002699	0.011217	0.003822	0.002409	0.001043	0.005897
5.0	0.016745	0.008023	0.001538	0.005385	0.003112	0.001391	0.000502	0.002356
6.0	0.013917	0.003754	0.000508	0.001258	0.002266	0.000515	0.000126	0.000398
7.0	0.011946	0.001806	0.000171	0.000298	0.001794	0.000212	0.000034	0.000071
8.0	0.010502	0.000888	0.000058	0.000071	0.001498	0.000094	0.000010	0.000013
9.0	0.009401	0.000444	0.000020	0.000017	0.001299	0.000043	0.000003	0.000003
10.0	0.008535	0.000225	0.000007	0.000004	0.001157	0.000021	0.000001	0.000001

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	MILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.415082	2.326080	3.487127	4.303956	1.046692	5.713156	5.695379	50.374062
0.2	1.339895	2.076783	3.040868	3.583215	0.808829	4.346672	4.324356	37.779919
0.3	1.271194	1.859309	2.656907	2.993410	0.629603	3.326258	3.300910	28.460070
0.4	1.208285	1.668873	2.325671	2.508513	0.493771	2.560478	2.533299	21.535381
0.5	1.150562	1.501511	2.039192	2.108156	0.390201	1.982824	1.954765	16.368942
0.6	1.097491	1.353929	1.790835	1.776283	0.310739	1.544760	1.516549	12.497995
0.7	1.048597	1.223367	1.575047	1.500173	0.249379	1.210744	1.182931	9.585201
0.8	1.003461	1.107515	1.387170	1.269693	0.201688	0.954647	0.927631	7.383875
0.9	0.961720	1.004421	1.223268	1.076706	0.164373	0.757188	0.731248	5.712949
1.0	0.923039	0.912435	1.080020	0.914663	0.134981	0.604074	0.579394	4.439046
1.1	0.887130	0.830154	0.954611	0.778255	0.111673	0.484672	0.461364	3.463604
1.2	0.853732	0.756381	0.844642	0.663156	0.093064	0.391029	0.369150	2.713450
1.3	0.822619	0.690093	0.748068	0.565834	0.078110	0.317176	0.296740	2.134093
1.4	0.793581	0.630402	0.663139	0.483382	0.066011	0.258607	0.239596	1.684767
1.5	0.766433	0.576553	0.588354	0.413405	0.056161	0.211906	0.194281	1.334857
1.6	0.741013	0.527884	0.522419	0.353920	0.048090	0.174469	0.158175	1.061281
1.7	0.717173	0.483824	0.464222	0.303278	0.041436	0.144305	0.129276	0.846557
1.8	0.694781	0.443871	0.412798	0.260107	0.035917	0.119877	0.106044	0.677397
1.9	0.673714	0.407589	0.367314	0.223260	0.031314	0.100000	0.087287	0.543651
2.0	0.653867	0.374595	0.327045	0.191773	0.027453	0.083751	0.072083	0.437543
2.2	0.617455	0.317160	0.259719	0.141779	0.021436	0.059403	0.049606	0.285644
2.4	0.584872	0.269312	0.206688	0.105066	0.017071	0.042716	0.034515	0.188257
2.6	0.555566	0.229280	0.164796	0.078021	0.013845	0.031104	0.024250	0.125124
2.8	0.529082	0.195659	0.131620	0.058042	0.011420	0.022908	0.017187	0.083787
3.0	0.505041	0.167325	0.105286	0.043248	0.009566	0.017051	0.012276	0.056480
3.5	0.453667	0.114093	0.060611	0.020850	0.006524	0.008493	0.005450	0.021594
4.0	0.411971	0.078566	0.035143	0.010122	0.004783	0.004455	0.002505	0.008492
4.5	0.377445	0.054542	0.020497	0.004941	0.003713	0.002445	0.001184	0.003413
5.0	0.348370	0.038121	0.012014	0.002423	0.003014	0.001396	0.000573	0.001396
6.0	0.302038	0.018930	0.004178	0.000589	0.002189	0.000504	0.000143	0.000243
7.0	0.266664	0.009562	0.001472	0.000145	0.001734	0.000203	0.000038	0.000044
8.0	0.238692	0.004894	0.000524	0.000036	0.001452	0.000088	0.000011	0.000008
9.0	0.215969	0.002530	0.000188	0.000009	0.001263	0.000041	0.000003	0.000002
10.0	0.197116	0.001319	0.000068	0.000002	0.001129	0.000019	0.000001	0.000000

TABLE 17 G. CRRES Omnidirectional Geometric Factors for Power Law Spectra $\sin^8 \alpha$ Pitch Angle Path Length Distribution Computation, $\lambda = 90$

FLUX OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL				LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	0.135233	0.880263	0.687336	12.384627	2.394875	12.069874	11.774307	200.089874
0.2	0.125138	0.770593	0.590474	10.230530	1.781292	8.898182	8.664156	146.333206
0.3	0.116056	0.676840	0.508549	8.482408	1.332880	6.591419	6.403790	107.411942
0.4	0.107869	0.596360	0.439030	7.056846	1.003758	4.907397	4.755107	79.143707
0.5	0.100475	0.526997	0.379859	5.889045	0.761073	3.673072	3.548003	58.545525
0.6	0.093785	0.466986	0.329346	4.928359	0.581240	2.764523	2.660652	43.484966
0.7	0.087719	0.414880	0.286107	4.134997	0.447282	2.092767	2.005607	32.433796
0.8	0.082209	0.369478	0.248996	3.477449	0.346940	1.593748	1.519913	24.294683
0.9	0.077195	0.329791	0.217067	2.930691	0.271338	1.221214	1.158134	18.277225
1.0	0.072623	0.294987	0.189532	2.474679	0.214023	0.941667	0.887364	13.810822
1.1	0.068447	0.264380	0.165734	2.093304	0.170293	0.730771	0.683711	10.482154
1.2	0.064626	0.237389	0.145125	1.773545	0.136702	0.570783	0.529760	7.991162
1.3	0.061124	0.213523	0.127243	1.504834	0.110722	0.448721	0.412779	6.119140
1.4	0.057907	0.192370	0.111699	1.278543	0.090485	0.355050	0.323418	4.706269
1.5	0.054949	0.173578	0.098164	1.087616	0.074607	0.282737	0.254792	3.635332
1.6	0.052223	0.156847	0.086361	0.926238	0.062056	0.226578	0.201807	2.820077
1.7	0.049708	0.141921	0.076053	0.789621	0.052062	0.182700	0.160678	2.196770
1.8	0.047383	0.128580	0.067037	0.673795	0.044044	0.148200	0.128581	1.718182
1.9	0.045230	0.116633	0.059142	0.575464	0.037564	0.120935	0.103401	1.349146
2.0	0.043234	0.105917	0.052219	0.491882	0.032289	0.099238	0.083544	1.063400
2.2	0.039656	0.087628	0.040804	0.360167	0.024390	0.067906	0.055268	0.667827
2.4	0.036553	0.072780	0.031972	0.264411	0.018933	0.047403	0.037165	0.425055
2.6	0.033847	0.060663	0.025114	0.194556	0.015063	0.033695	0.025362	0.273844
2.8	0.031473	0.050726	0.019772	0.143443	0.012251	0.024349	0.017536	0.178365
3.0	0.029382	0.042542	0.015598	0.105946	0.010161	0.017858	0.012268	0.117319
3.5	0.025124	0.027719	0.008689	0.050000	0.006842	0.008703	0.005243	0.042679
4.0	0.021896	0.018318	0.004886	0.023781	0.005000	0.004535	0.002354	0.016179
4.5	0.019386	0.012251	0.002769	0.011381	0.003882	0.002495	0.001099	0.006328
5.0	0.017394	0.008277	0.001580	0.005475	0.003156	0.001436	0.000529	0.002536
6.0	0.014451	0.003876	0.000523	0.001283	0.002295	0.000529	0.000132	0.000430
7.0	0.012401	0.001866	0.000176	0.000305	0.001817	0.000217	0.000036	0.000077
8.0	0.010899	0.000917	0.000060	0.000073	0.001518	0.000096	0.000010	0.000014
9.0	0.009754	0.000459	0.000021	0.000018	0.001317	0.000044	0.000003	0.000003
10.0	0.008854	0.000233	0.000007	0.000004	0.001174	0.000021	0.000001	0.000001

DOSE OMNIDIRECTIONAL GEOMETRIC FACTORS (cm^2 MeV)

	HILET CHANNEL			multiply by 10^{-3}	LOLET CHANNEL			
N	1	2	3	4	1	2	3	4
0.1	1.448170	2.334585	3.486959	4.216434	1.082308	5.846650	5.821588	51.383945
0.2	1.372022	2.085778	3.041636	3.512939	0.836687	4.451774	4.423984	38.570232
0.3	1.302396	1.868589	2.658437	2.936846	0.651559	3.409578	3.380049	29.081852
0.4	1.238594	1.678279	2.327786	2.462896	0.511207	2.626970	2.596551	22.027136
0.5	1.180015	1.510918	2.041754	2.071289	0.404154	2.036230	2.005614	16.759748
0.6	1.126120	1.363235	1.793726	1.746438	0.321986	1.587924	1.557656	12.810072
0.7	1.076431	1.232501	1.578160	1.475979	0.258511	1.245835	1.216341	9.835510
0.8	1.030536	1.116415	1.390418	1.250051	0.209155	0.983335	0.954921	7.585466
0.9	0.988063	1.013047	1.226583	1.060743	0.170519	0.780765	0.753640	5.875924
1.0	0.948680	0.920757	1.083346	0.901676	0.140072	0.623546	0.597848	4.571297
1.1	0.912098	0.838151	0.957902	0.767680	0.115915	0.500826	0.476634	3.571268
1.2	0.878055	0.764042	0.847864	0.654541	0.096620	0.404489	0.381831	2.801377
1.3	0.846322	0.697408	0.751194	0.558811	0.081106	0.328434	0.307307	2.206105
1.4	0.816688	0.637373	0.666149	0.477656	0.068549	0.268057	0.248429	1.743897
1.5	0.788969	0.583181	0.591232	0.408735	0.058320	0.219865	0.201685	1.383529
1.6	0.763002	0.534176	0.525157	0.350111	0.049935	0.181193	0.164399	1.101431
1.7	0.738637	0.489785	0.466815	0.300172	0.043019	0.150000	0.134520	0.879744
1.8	0.715739	0.449512	0.415243	0.257575	0.037281	0.124715	0.110471	0.704880
1.9	0.694190	0.412921	0.369611	0.221196	0.032493	0.104119	0.091033	0.566451
2.0	0.673877	0.379628	0.329197	0.190093	0.028475	0.087264	0.075258	0.456485
2.2	0.636589	0.321634	0.261591	0.140668	0.022213	0.061975	0.051899	0.298775
2.4	0.603196	0.273277	0.208301	0.104335	0.017668	0.044612	0.036180	0.197405
2.6	0.573141	0.232786	0.166177	0.077542	0.014309	0.032509	0.025465	0.131522
2.8	0.545964	0.198752	0.132795	0.057732	0.011784	0.023956	0.018077	0.088279
3.0	0.521280	0.170051	0.106280	0.043050	0.009855	0.017835	0.012931	0.059644
3.5	0.468489	0.116071	0.061255	0.020790	0.006693	0.008879	0.005758	0.022925
4.0	0.425600	0.079997	0.035553	0.010108	0.004887	0.004650	0.002652	0.009059
4.5	0.390061	0.055574	0.020755	0.004941	0.003782	0.002545	0.001255	0.003657
5.0	0.360116	0.038866	0.012175	0.002426	0.003064	0.001449	0.000608	0.001502
6.0	0.312368	0.019318	0.004239	0.000591	0.002220	0.000519	0.000151	0.000264
7.0	0.275890	0.009766	0.001495	0.000145	0.001758	0.000208	0.000040	0.000048
8.0	0.247032	0.005001	0.000532	0.000036	0.001473	0.000090	0.000011	0.000009
9.0	0.223581	0.002587	0.000191	0.000009	0.001282	0.000041	0.000003	0.000002
10.0	0.204116	0.001349	0.000069	0.000002	0.001147	0.000020	0.000001	0.000000

8. GEOMETRIC FACTOR COMPARISONS

8.1 ISOTROPIC DISTRIBUTION

In Section 7 tables of the Omnidirectional Geometric Factors were provided for power law spectra for both the DMSP and CRRES dosimeters for the infinite slab approximation, the truncated infinite slab path length distribution and the path length distribution. A comparison of the results of these computations is provided in graphical form for dosimeters 1 and 4 in Figures 33 to 40. Only particle entry through the top is taken into account for the both the infinite slab approximation, and the truncated infinite slab approximation. The same path length distribution is applicable; the latter differs from the former only by the truncation of the infinite slab path length distribution at $q = q_{max}$ and its renormalization. The effect of truncation is that unphysical path lengths are eliminated, resulting in a higher weighting for valid path lengths. The net result on the calculations is to decrease the high energy contributions (due to a lack of larger path lengths) and slightly increase the low energy contributions (because of the higher weighting), and this is evident in the HILET flux and dose channels (Figures 33 to 36). This effect is, as expected, more evident in detector 1, because of its higher *D/R* ratio. For small N, the differences are large, and rapidly decrease as N ~ 2, and remain small for larger N. For LOLET channels (Figures 37 to 40) the differences are small. The differences in detector 4 (Figures 35, 36, 37, and 40) are much smaller because of its small *D/R* ratio.

The path length distribution differs from the other two distributions in three ways: there is no minimum path length, and both edge effects and side entry, (with side to side path lengths up to q_{max}) are taken into account. This results in higher geometric factors for the LOLET channels, and, except for small values of N, higher geometric factors for the HILET channels.

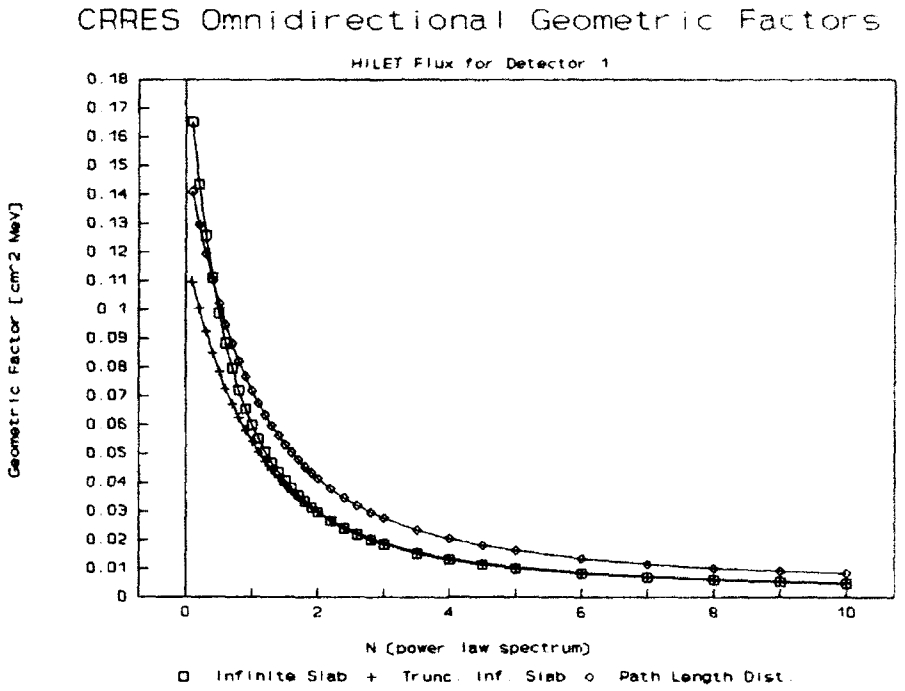

Figure 33.

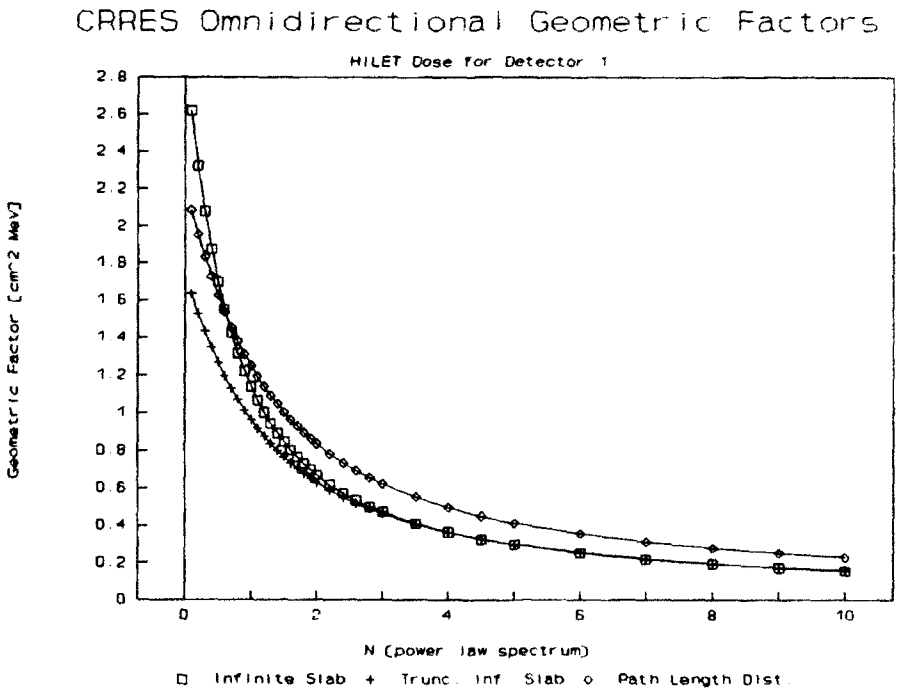

Figure 34.

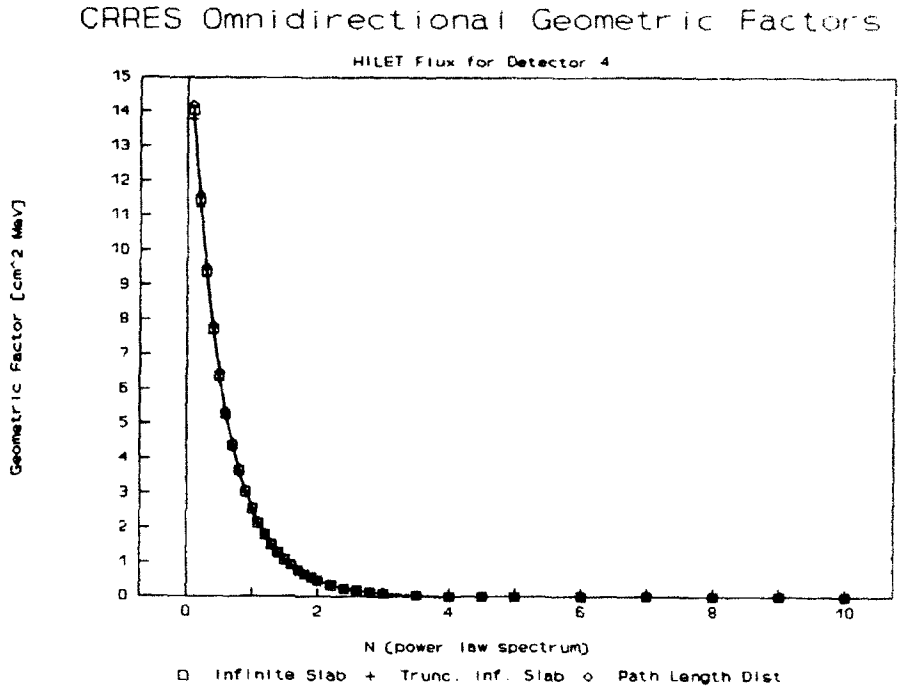

Figure 35.

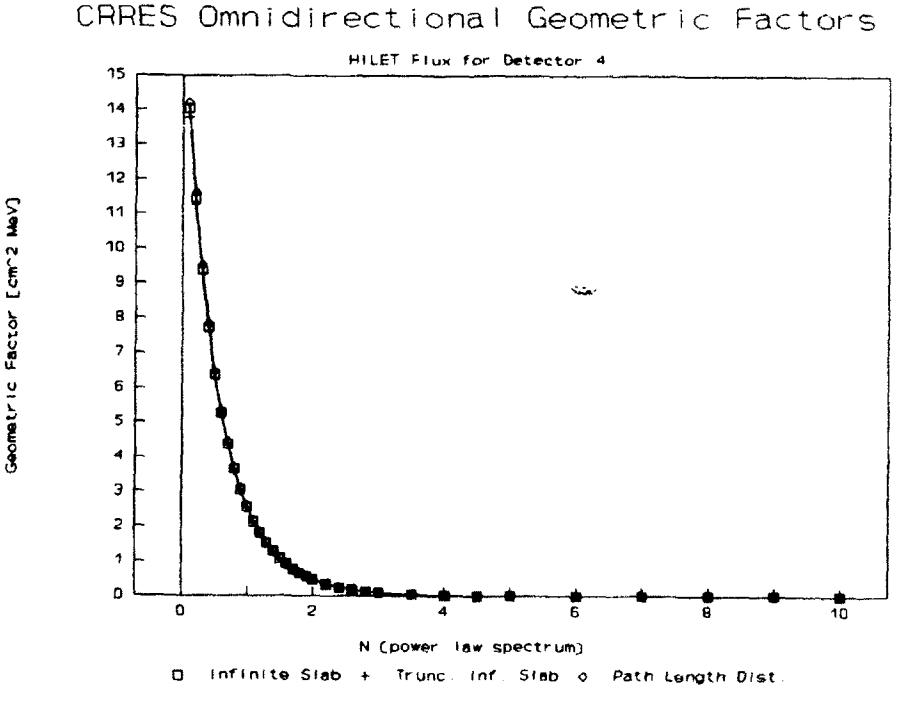

Figure 36.

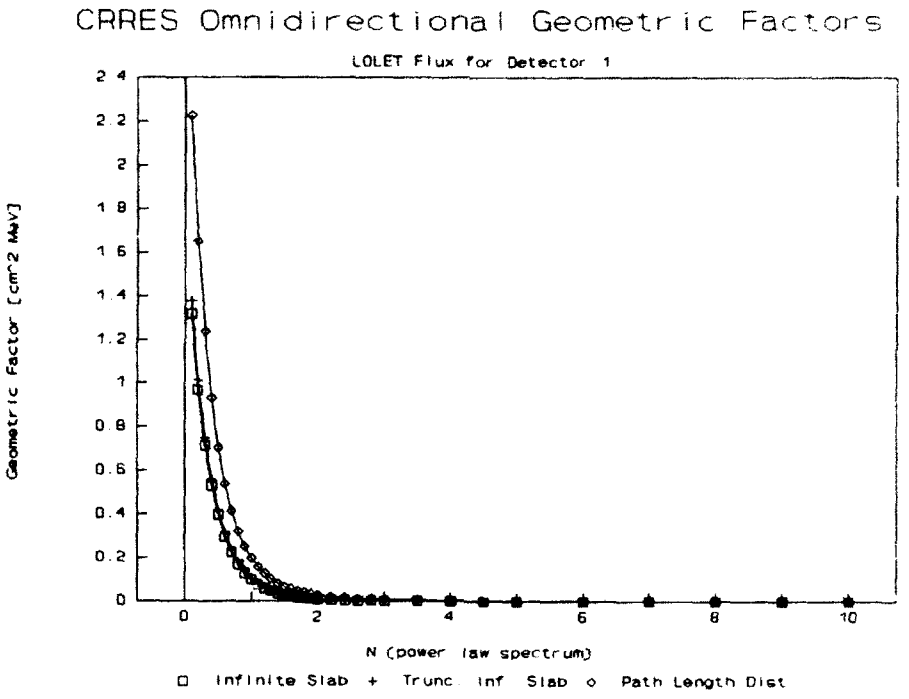

Figure 37.

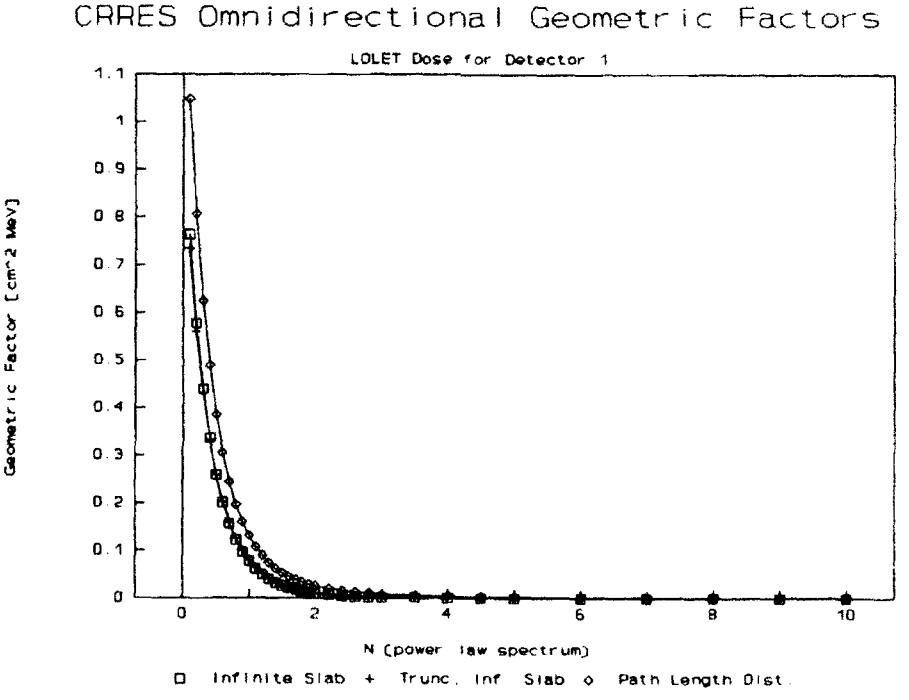

Figure 38.

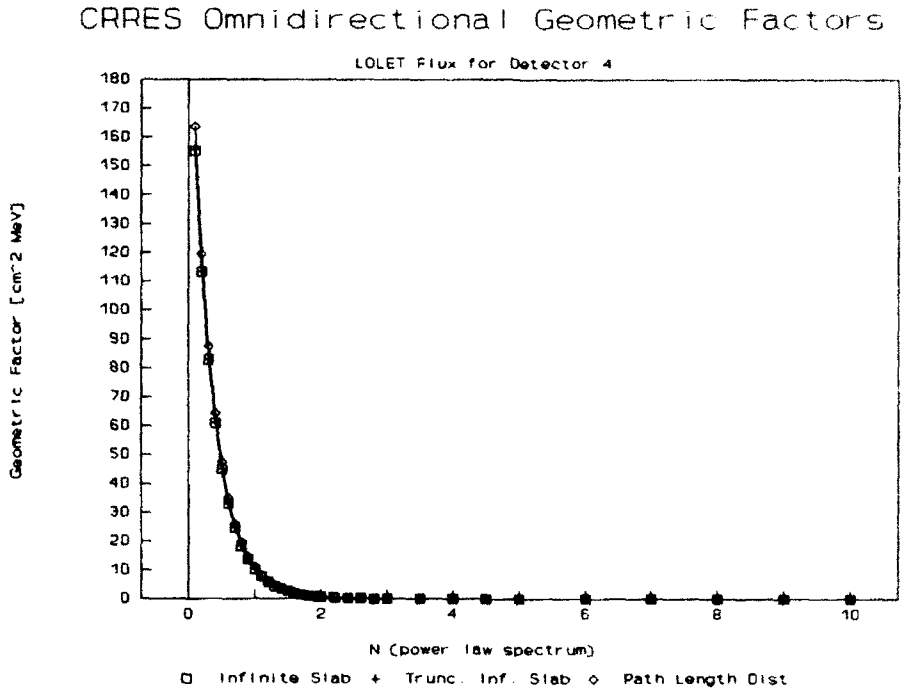

Figure 39.

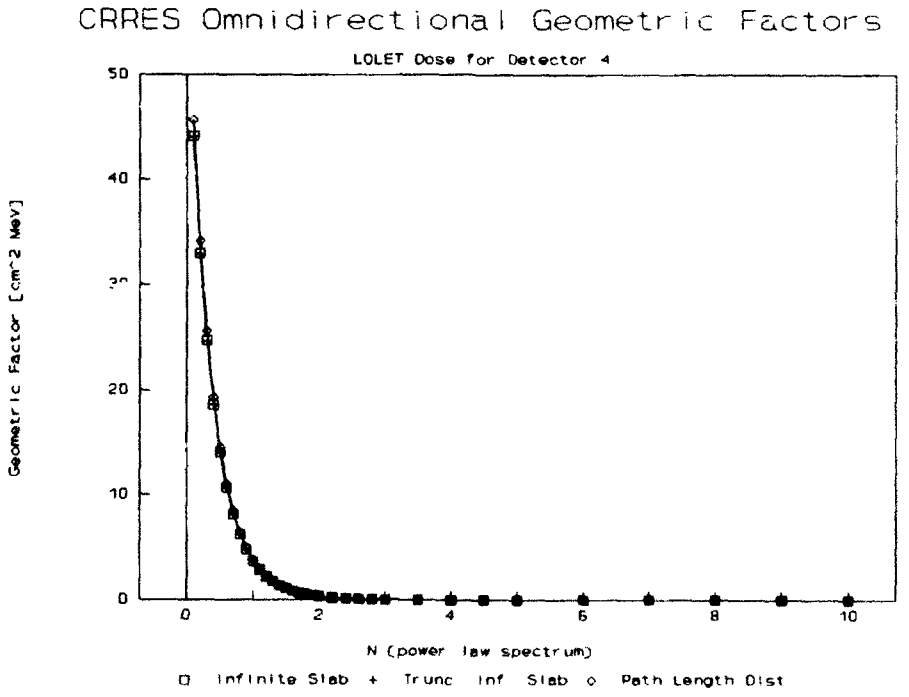

Figure 40.

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